AN EFFICIENCY STUDY ON THE U.S. AIR FORCE'S CONSIDERATION OF ALLOWING ENLISTED PERSONNEL TO FLY MEDIUM-ALTITUDE LONG-ENDURANCE (MALE) REMOTELY PILOTED AIRCRAFT (RPA) OR UNMANNED AERIAL SYSTEMS (UAS)

A thesis presented to the Faculty of the U.S. Army
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degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

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The U.S. Air Force is presently debating the idea of authorizing enlisted airmen to pilot remotely piloted aircraft (RPA). The U.S. Army already authorizes enlisted soldiers to pilot their medium-altitude long-endurance unmanned aerial systems (UAS). The demand for more RPA pilots, and the Air Force's inability to retain current RPA pilots, has precipitated a manning crisis. The Army has not faced a manning or retention crisis because the lead time is shorter to recruit and train enlisted soldiers since college is not required. The Army spends approximately $111,000 to train one UAS operator; however, the Air Force could spend up to $786,000 to commission and train one RPA pilot. In comparison, the cost of training Army UAS operators is only 14 percent of the cost of training Air Force RPA pilots. This research investigates how enlisted airmen could improve retention rates, reduce military personnel costs, reduced costs associated with training, and create a shorter lead time for RPA pilots.

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

AN EFFICIENCY STUDY ON THE U.S. AIR FORCE'S CONSIDERATION OF ALLOWING ENLISTED PERSONNEL TO FLY MEDIUM-ALTITUDE LONG-ENDURANCE (MALE) REMOTELY PILOTED AIRCRAFT (RPA) OR UNMANNED AERIAL SYSTEMS (UAS), by Major Lendrick James, U.S. Army, 78 pages.

The U.S. Air Force is presently debating the idea of authorizing enlisted airmen to pilot remotely piloted aircraft (RPA). The U.S. Army already authorizes enlisted soldiers to pilot their medium-altitude long-endurance unmanned aerial systems (UAS). The demand for more RPA pilots, and the Air Force's inability to retain current RPA pilots, has precipitated a manning crisis. The Army has not faced a manning or retention crisis because the lead time is shorter to recruit and train enlisted soldiers since college is not required. The Army spends approximately $111,000 to train one UAS operator; however, the Air Force could spend up to $786,000 to commission and train one RPA pilot. In comparison, the cost of training Army UAS operators is only 14 percent of the cost of training Air Force RPA pilots. This research investigates how enlisted airmen could improve retention rates, reduce military personnel costs, reduced costs associated with training, and create a shorter lead time for RPA pilots.

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ACRONYMS

AFPC	Air Force Personnel Center
AFSC	Air Force Specialty Code
BCA	Budget Control Act
BEAR	Bonus Extension and Retraining
CAP	Combat Air Patrol
DoD	Department of Defense
FAA	Federal Aviation Administration
FTU	Formal Training Units
FY	Fiscal Year
FYPD	Future Years Defense Program
GAO	Government Accountability Office
ISR	Intelligence, Surveillance and Reconnaissance
MOS	Military Occupation Specialty
NCO	Non-Commissioned Officer
OCO	Overseas Contingency Operations
OCS	Officer Candidate School
OTS	Officer Training School
PIC	Pilot in Command
ROTC	Reserve Officers' Training Corps
RPA	Remote Piloted Aircraft
SO	Sensor Operator
SRB	Selective Reenlistment Bonus

UAS	Unmanned Aerial Systems
UPT	Undergraduate Pilot Training
URT	Undergraduate RPA Training

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CHAPTER 1

INTRODUCTION

Background

The remotely piloted aircraft (RPA) and unmanned aircraft systems (UAS) have had tremendous growth in demand by the U.S. military since 2001. Technological progress in propulsion, autonomous operations, sensors, weapons, and miniaturization of many components, buoyed by recent operational success for RPA and UAS in Iraq and Afghanistan, prompted significant interest in the development of more UAS. The Department of Defense (DoD) defines a UAS as "a system whose components include the necessary equipment, networks, and personnel to control an unmanned aircraft," which is an aircraft that does not carry a human operator and is capable of flight under remote control or autonomous programming (Under Secretary of Defense for Acquisition, Technology, and Logistics (USD AT&L 2012, 3-12).

There is a large emphasis on RPA and UAS because of their long-endurance, unmanned intelligence, surveillance and reconnaissance (ISR) assets—many with strike capabilities which are a direct reflection of recent operational experience and further combatant commander demands. The increase in demand has resulted in a large number of RPA and UAS capable of a wide range of missions. These large numbers of fielded RPA and UAS have increased the demand for RPA pilots and UAS operators (USD AT&L 2012, 3-12).

As of December 16, 2011, the labor requirements for the Air Force's RPA pilots and sensor operators (SOs) to support fifty-seven MQ-1/9 and four RQ-4 Combat Air Patrols (CAPs,) including operational, test, and training requirements, as well as

appropriate overhead and staff requirements, were 1,696 pilots and 1,194 SOs. However, they had a shortfall of 338 RPA pilots and 245 SOs. The Fiscal Year (FY) 2015 labor requirements for RPA pilots and SOs increased to 2,060 RPA pilots and 1,454 SOs. In order to meet this RPA aircrew labor requirement, the Air Force implemented two initiatives. The first initiative created Undergraduate RPA Training (URT) for RPA pilots with the 18X Air Force Specialty Code (AFSC), as well as a distinct training pipeline for RPA SOs with the 1U AFSC. These programs solve the problem of insufficient capacity in existing pipelines (Undergraduate Pilot Training (UPT) and 1N AFSC training) to meet RPA aircrew operational requirements (USD AT&L 2012, 3-12).

The second initiative increased the capacity of the MQ-1/9 Formal Training Units (FTUs) in order to meet operational RPA requirements. There is currently one active duty MQ-1 FTU and one active duty MQ-9 FTU, as well as a launch and recovery training squadron. Additionally, there is an Air National Guard MQ-1 FTU and an Air National Guard MQ-9 FTU producing pilots. As the Air Force evolves toward an MQ-9 fleet, aircrew production focus will shift from MQ-1 to MQ-9, which will require standing up an additional active duty MQ-9 FTU. The expected capacity of the MQ-1/9 FTUs will be 310 initial qualifications MQ-1/9 aircrew and thirty MQ-1 to MQ-9 aircrew conversions in FY 2012 and 360 initial qualifications MQ-1/9 aircrew and forty MQ-1 to MQ-9 aircrew conversions in FY 2013. For the RQ-4, there is one active duty FTU that has a capacity of seventy-two pilots and thirty-six SOs per year (USD AT&L 2012, 3-12).

As of December 16, 2011, the labor requirements for the Army’s MQ-1C, MQ-5B, RQ-7B and RQ-11B were 1,456 for operators, 818 for mechanics and 200 for warrant officers. In FY 2015, the labor requirements are 2,057 for operators, 1,173 for

mechanics and 316 for warrant officers. Due to the rapid growth of the Army UAS fleet, all three of these military occupational specialties (MOSs) have stressed to maintain pace with demand (USD AT&L 2012, 3-12).

Secretary of Defense Robert Gates called upon airmen to think critically about many of the challenges facing the Air Force, specifically questioning whether or not future operators of RPA and UAS need to be rated pilots (Cantwell 2009, 67-77).

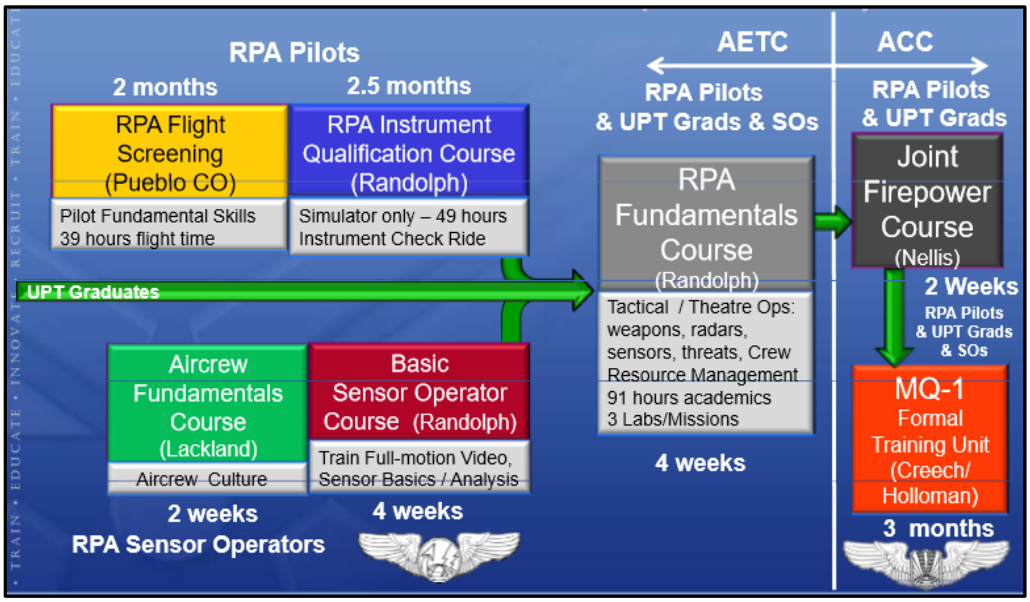


Figure 1. Remotely Piloted Aircraft Training Requirements by Phase

Source: James A. Whitmore, “Moving Forward: The Next Generation of Combat Aviators,” Director of Intelligence, Operations and Nuclear Integration Air Education and Training Command, accessed February 28, 2016, ProQuest Dissertation and Theses, 9.

Categories of Unmanned Aerial Systems

DoD classifies its UAS into five groups that are based on attributes of weight and capabilities including vehicle airspeed and operating altitude. In Group 1, a UAS may

weigh twenty pounds or less, whereas Group 5 UAS weigh more than 1,320 pounds. Service members who operate the larger and more capable UAS, in Group 3 or above, are either manned aircraft pilots or pilots specializing in flying UAS and are to receive four or more months of training to prepare them to fly UAS (USD AT&L 2012, 3-12).

In contrast, personnel who operate the less capable UAS that are classified in Groups 1 and 2 generally operate UAS as an additional duty. Service members who operate UAS in Group 1 receive about two weeks of training and personnel who operate UAS in Group 2 receive anywhere from two weeks to three months of training (GAO 2015, 1-37).

Each of the services flies various types of large UAS in groups 3, 4, and 5. The Air Force flies the MQ-1 (Predator), the MQ-9 (Reaper), and the larger RQ-4 (Global Hawk). The Army flies the RQ-7 (Shadow), the MQ-5 (Hunter) and the MQ-1C (Gray Eagle). The Marine Corps flies the RQ-7B (Shadow) and the RQ-21A (Black Jack). Finally, the Navy flies the MQ-4C (Triton) and the MQ-8 (Fire Scout) (USD AT&L 2012, 3-12).

UAS Category	Max Gross Takeoff Weight	Normal Operating Altitude (Ft)	Airspeed	Current Army UAS in Operation
Group 1	< 20 pounds	< 1200 above ground level (AGL)	<100 Knots	RQ-11B Raven
Group 2	21-55 pounds	< 3500 AGL	<250 Knots	No current system
Group 3	< 1320 pounds	<18,000 mean sea level (MSL)		RQ-7B Shadow
Group 4	> 1320 pounds		Any Airspeed	MQ-5B, MQ-1C
Group 5		> 18,000 MSL		No current system

Table 2-2 UAS Current Systems

Figure 2. Unmanned Aerial Systems Category Groups

Source: U.S. Army UAS Center of Excellence, *"Eyes of the Army" U.S. Army Roadmap for Unmanned Aircraft Systems 2010-2035* (Fort Rucker, AL: U.S. Army UAS Center of Excellence), 12, accessed November 12, 2015, http://www.rucker.army.mil/usaace/uas/US%20Army%20UAS%20RoadMap%202010%202035.pdf.

Remote Piloted Aircraft Pilots versus Unmanned Aerial Systems Operators

Training DoD RPA pilots and UAS operators, most of whom are in the Army or the Air Force, is an integral part of DoD's strategy to accomplish its mission. Each service uses a different term to refer to the UAS pilot position and a different strategy to assign personnel to this position. The Air Force uses the term RPA and assigns officers to this position (USD AT&L 2012, 3-12).

Specifically, the Air Force assigns various types of officers to serve in these positions including temporarily re-assigned manned-aircraft pilots and other Air Force aviation officers who have converted to this career permanently, graduates of manned-aircraft pilot training on their first assignment, and pilots who specialize in flying RPA with limited manned-aircraft experience (USD AT&L 2012, 3-12).

The Army uses the term unmanned aircraft system operator and assigns enlisted personnel as UAS operators. They receive no manned aircraft flight training. The Army uses three MOSs to support UAS. Two of these MOS, 15W Operator and 15E Repairer, are for enlisted soldiers, and one, 150U Technician, is for a warrant officer. The exception to this is the small RQ-11B Raven systems, which are operated by any Soldier, qualified through a ten-day flight training course. The 15W Operator is qualified to fly the aircraft, operate the sensors, and emplace/displace the system. An additional skill identifier tracks individual aircraft qualifications (USD AT&L 2012, 3-12).

The 15W is the feeder MOS for the 150U Technician MOS. The 15E Repairer is responsible for the maintenance of all parts of the UAS, to include, ground control stations, data links, and supporting equipment. The 15E, like the 15W, has an additional skill identifier to denote specific system qualifications. The 150U Warrant Officer provides leadership and expertise in the UAS unit. These individuals interface with the higher headquarters and provide oversight of aviation safety, standardization, and maintenance program (USD AT&L 2012, 3-12).

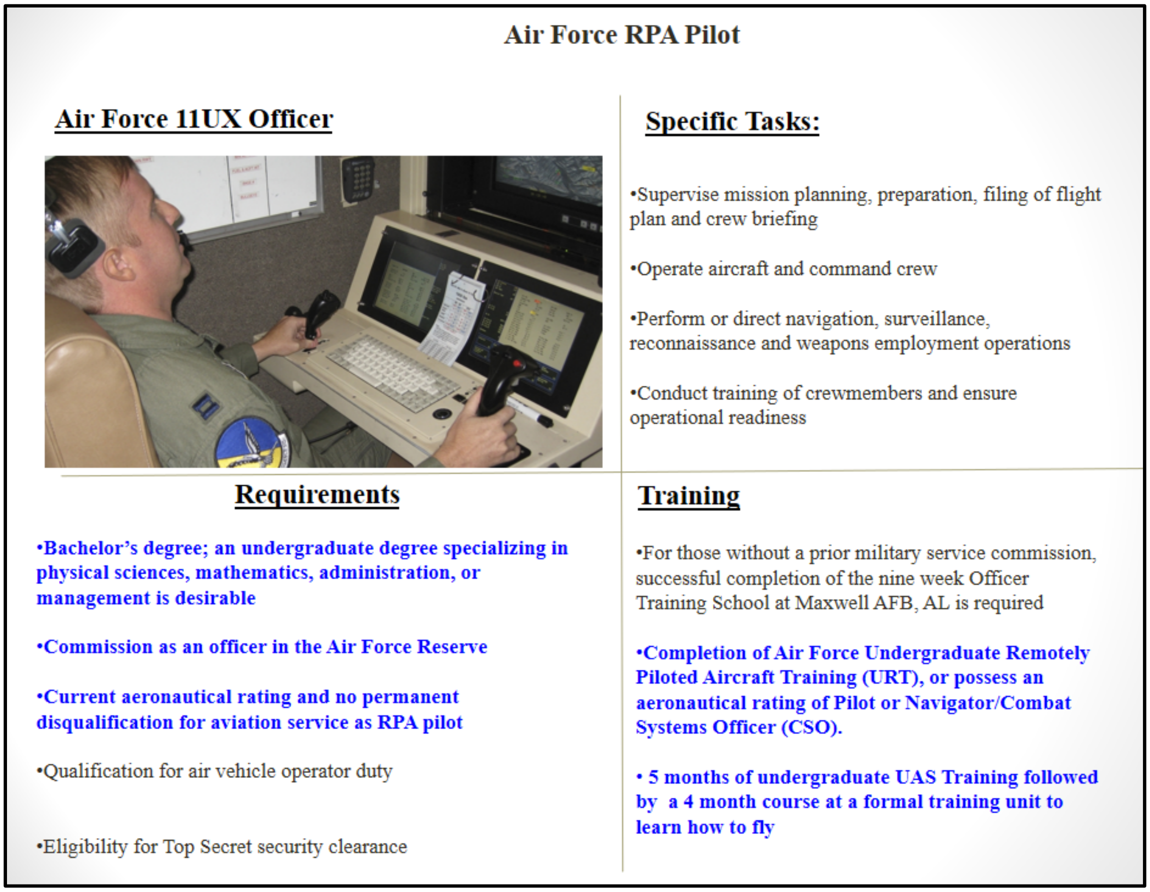


Figure 3. Air Force Remote Piloted Aircraft Pilot Requirements

Source: Will Charpentier, "RPA Pilot Officer Requirements," The Nest, accessed November 12, 2015, http://woman.thenest.com/rpa-pilot-officer-requirements-21970.html.

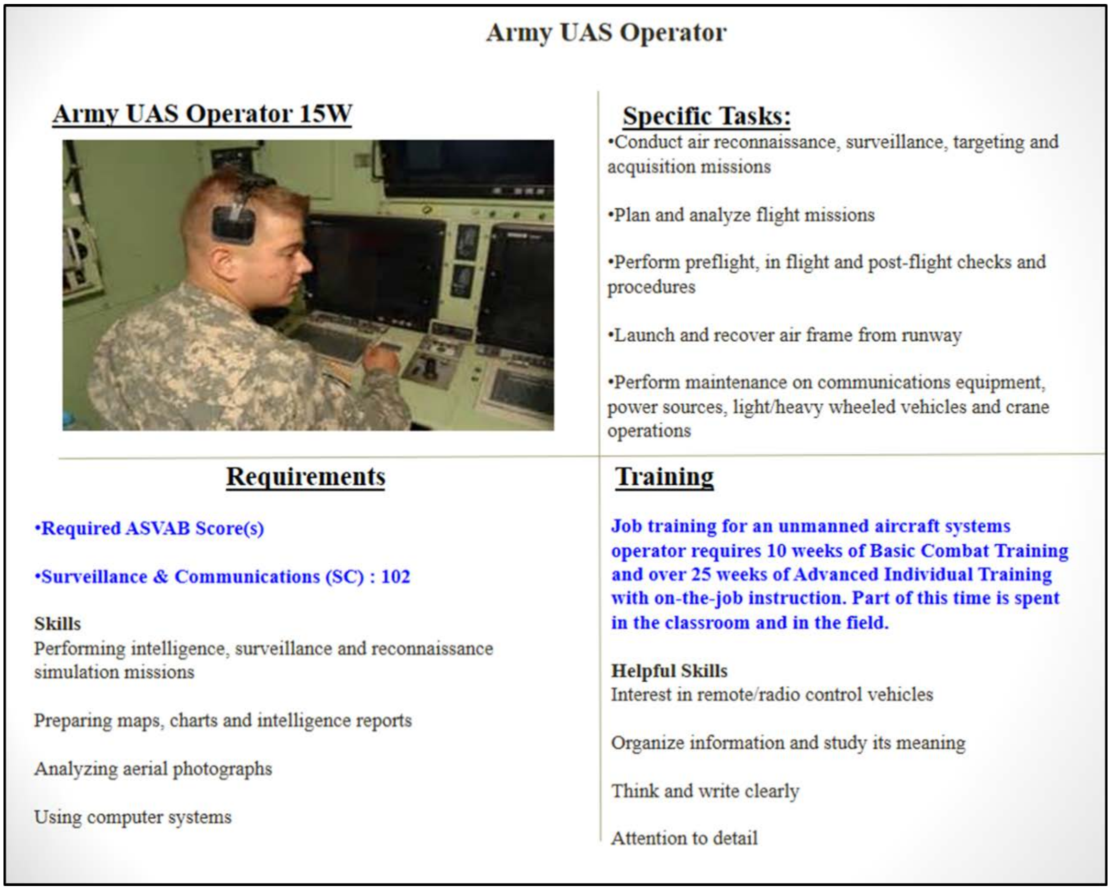


Figure 4. Army Unmanned Aircraft Systems Operator Requirements

Source: U.S. Army, "Unmanned Aircraft Systems Operator 15W," accessed September 3, 2015, http://www.goarmy.com/careers-and-jobs/browse-career-and-job-categories/transportation-and-aviation/unmanned-aerial-vehicle-operator.html.

Medium-Altitude Long-Endurance Unmanned Aerial Systems

The MQ-1 Predator was an Air Force Advanced Concept Technology Demonstration in 1994; it transitioned to an Air Force program in 1997. It has flown surveillance missions since 1995 and was armed with Hellfire missiles in 2001. The Air Force uses rated pilots to operate the MQ-1 Predator (USD AT&L 2012, 3-12).

The Army’s MQ-1C Grey Eagle is a variant of the MQ-1 that employs a diesel engine and is operated by the Army’s One System ground control station. MQ-1C includes electro-optical/infrared sensors with full motion video and synthetic aperture radar sensors. A laser rangefinder/designator and hard points under the wings provide attack capability. The operating ceiling is 28,000 feet. It has an 800-pound external payload capacity, an endurance of around twenty-eight hours, and a loiter speed of sixty knots. MQ-1C is fielded to each of the Army’s divisions. The Army uses operators, not rated pilots (USD AT&L 2012, 3-12).

Army’s Grey Eagle **Versus** **Air Force’s Predator**

Wing Span	55/56 ft
Max GTW	2550/3600 lbs
Range With Relay	125km LOS/1200 km SATCOM
Max Airspeed	120/130 knots (A/O)
Altitude	25000/29000 ft
Endurance	22/18 hours
Weapon	Up to 2/4 Hellfire Missiles
Launch Recovery	3000/3200 ft @ 9k ft DA (A/O)

Wing Span	55 ft
Max GTW	2250 lbs
Range With Relay	125km LOS/1200 km SATCOM
Max Airspeed	70 knots
Altitude	26000 ft
Endurance	24 hours
Weapon	Up to 2/4 Hellfire Missiles
Launch Recovery	3000/3200 ft @ 9k ft DA (A/O)

Figure 5. U.S. Army Grey Eagle versus U.S. Air Force Predator

Source: General Atomics Aeronautical, “Gray Eagle UAS,” accessed November 12, 2015, http://www.ga-asi.com/gray-eagle.

Federal Aviation Administration Guidance on Rated Pilots versus Operators

The Federal Aviation Administration's (FAA) requirement for the pilot in command (PIC) to hold a pilot certificate is based on various factors including the location of the planned operations, mission profile, size of the UAS, and whether or not the operation is conducted within or beyond visual line of sight. Operations without a pilot certificate may be allowed, permitting smaller UAS to operate below certain altitudes while controlled strictly by visual line of sight. The cutoff point at which the smaller UAS criteria will be utilized is yet to be defined; therefore, each application will be carefully reviewed to assess the feasibility of allowing that type of operation (FAA 2016).

Operations Requiring a Pilot Certificate

The PIC shall hold, at a minimum, an FAA pilot certificate under the following circumstances: all operations approved for conduct in Class A, C, D, and E airspace; all operations conducted under instrument flight rules (FAA instrument rating required); all operations approved for nighttime operations; all operations conducted at joint use or public airfields; all operations conducted beyond line of sight; at any time the FAA has determined the need based on the UAS' characteristics, mission profile, or other operational parameters. Class A airspace is applied to all airspace between 18,000 feet and approximately 60,000 feet. Class C airspace is used around airports with a moderate traffic level. Class D is used for smaller airports that have a control tower. Other controlled airspace is designated as Class E, this includes a large part of the lower airspace (FAA 2016).

Operations Not Requiring a Pilot Certificate

The PIC may not be required to hold a pilot certificate for operations approved and conducted solely within visual line of sight in Class G airspace. Class G is uncontrolled airspace. It is mostly used for a small layer of airspace near the ground, but there are larger areas of Class G airspace in remote regions. For the PIC to be exempt from the pilot certificate requirement the following conditions must exist and the alternate compliance method described below must be followed: the operation is conducted in a sparsely populated location; the operation is conducted from a privately owned airfield, military installation, or off-airport location; visual line of sight operations conducted no further than one nautical mile laterally from the UAS pilot and at an altitude of no more than 400 feet above ground level at all times; operations shall be conducted during daylight hours only; and operations shall be conducted no closer than five nautical miles from any airport or heliport (FAA 2016).

Problem Identified

The Air Force is struggling to keep up with the demand for RPA pilots. Part of the problem is overwork. Fighter pilots fly an average of 250 hours per year, but RPA pilots fly about 900 hours per year. The RPA community has been operating at surge capacity for eight years, and the Air Force has not churned out enough RPA pilots to keep up with the demand. Recruiting, manning, and training RPA pilots and UAS operators require long-lead times, especially regarding the funding to provide appropriate training opportunities to meet requirements. The Air Force will need to develop a process that can permanently fix the shortfall in RPA pilots (GAO 2014, 4-48).

Primary Research Question

The thesis question is; why has the Air Force refused to allow their enlisted personnel to operate RPA? Many observers inside and out of the Air Force agree enlisted airmen are capable of flying RPAs, given the proper training. Enlisted airmen at the controls of RPAs would open up a new source of potentially talented pilots, filling the Air Force's need for more ISR capability and helping ease the burden on undermanned, overworked commissioned officers flying RPAs like the MQ-1 Predator and the MQ-9 Reaper (Losey 2015, 1-4).

Secondary Research Questions

The subordinate question to this thesis is; why does the Army authorize enlisted personnel to flying medium altitude long endurance UAS such as the MQ-1C Grey Eagle? Some Air Force personnel believe the Army allows enlisted soldiers to fly their unmanned systems to save money. This allows lower-paid enlisted soldiers to do jobs officers in the Air Force do today. The Air Force is concerned that if they allow enlisted airmen to operate RPAs the pay differential between enlisted airmen and better-paid officers doing the same job could lead to disgruntlement and there could be conflicts regarding supervision (Losey 2015, 1-4).

Assumptions

Air Force RPA and UAS have become a critical component of military operations. However, one underlying assumption is that RPA pilots will not be developed quickly enough through the RPA pipeline. A lack of RPA pilots would greatly reduce

DoD's ISR capabilities. Another assumption is that enlisted airman will have enough aeronautical knowledge, competence, and experience to fly RPAs.

Another assumption is that it will not be feasible to utilize RPA pilots and UAS operators from other branches as well as civilian contractors to help fill the manpower shortage. This is a problem, which requires the Air Force to quantify the cost of their future force. The Air Force will need to complete the RPA pilot shortage based on projected program of record inventory levels. They will also need to study the future vision of the Air Force, which could allow officers to manage a team of RPA pilots while enlisted Airman operate single or multiple RPAs simultaneously (U.S. Air Force 2005, 15).

Limitations

The methodology presented in this study consisted of an in depth literature review. The researcher possesses fourteen years of military experience that helped him analyze the literature; however, research on the subject is limited to the size of the review. The researcher lacked experience in this area because he is not an RPA pilot or UAS operator. The research is limited in terms of time. The Air Force created the RPA pilot training pipeline in FY 2012 to help fast track and fix the current manning shortfall (GAO 2014, 4-48).

Not enough quantitative data is gathered to prove whether this RPA pipeline will be able to keep up with future demands. Technological advances are rapidly taking place to make UAS more intelligent each day. Another limitation is the measurable impacts on cultural bias of having rated pilots fill positions as RPA pilots. Air Force pilots are regarded as members of an elite group and today's Air Force subculture supports this

perception. Many Air Force officers believe only manned aircraft pilots are capable of operating RPA or UAS. It is difficult to predict the future cost of the Air Force structure (USD AT&L 2012, 33-24).

Scope and Delimitations

This study will assess feasibility and suitability of allowing enlisted airmen to pilot RPA in the Air Force. Changing the current policy of allowing enlisted airmen to fly RPA would require updates in force structure, doctrine, equipment, training, and sustainment. UAS technology is rapidly expanding and it is believed that one UAS operator will be able to operate multiple UAS simultaneously in the near future. Given the force reduction and the growing UAS technology this could be economically beneficial. This study will not examine policies of the Marines, Navy, and Coast Guard in reference to allowing enlisted personnel to operate RPA or UAS. The researcher focused on the Army and Air Force because they have significantly more RPA pilots and UAS operators than the other branches of service.

Significance of Study

This research is significant in relation to filling the shortage of Air Force RPA pilots and saving the government money by allowing enlisted airmen to operate RPAs. This would cause the Air Force to update their force structure, doctrine, and training requirements. Understanding the impact of authorizing enlisted airmen to operate RPAs will help officers better articulate the needs and requirement of the force. These factors will also influence the types of units organized and help determine differences in the capabilities of RPA pilots, UAS operators, non-commissioned officers (NCOs), and

enlisted soldiers. Obtaining this knowledge will greatly influence the ability to maintain readiness of the force. This will also influence the size of future defense budgets and policies.

Conclusion

The DoD continues to increase its investment in UAS to meet battlefield commanders' demand for their unique capabilities. DoD requested about $6.1 billion in FY 2010 for new UAS but the Air Force currently lacks the proper amount of RPA pilots to man them. The shortage of RPA pilots is an important problem to study and the decision to allow enlisted airmen to fly RPA could open up a new source of potentially talented pilots, filling the Air Force's need for more ISR capability. This would help ease the burden on undermanned, overworked commissioned officers flying RPAs like the MQ-1 Predator and the MQ-9 Reaper. The Army allows enlisted soldiers to fly its unmanned systems so the Air Force could possibly do the same. If the future vision of the Air Force is to allow their officers to manage teams of RPA pilots while enlisted airmen operate single or multiple RPAs simultaneously, this concept works well. It would save the government money because it would eliminate the cost associated with training pilots on manned aircraft (USD AT&L 2012, 33-24).

CHAPTER 2

LITERATURE REVIEW

As of December 16, 2011, the Air Force had a shortfall of 338 RPA pilots and 245 SOs. In FY 2011, the Air Force had a requirement for 1,696 pilots and 1,194 SOs, and in four years the requirements for increased to 2,060 RPA pilots and 1,454 SOs. Given the shortage of RPA pilots, this appears to be a viable option. The Air Force is struggling to keep up with the demand for RPA pilots. Part of the problem is overworked pilots. Fighter pilots fly an average of 250 hours per year, but RPA pilots fly about 900 hours per year. The primary research question is; why has the Air Force refused to allow their enlisted personnel to operate RPA? Adequate literature sources were used to obtain more insight into answering the primary research question (GAO 2014, 4-48).

The researcher used the literature review to analyze studies that investigated challenges and major complexities faced by the Air Force in order to meet their required strength level. It also covers how the Air Force failed to properly conduct human capital planning in order to properly fill RPA pilot positions. Research was also done on some of the challenges the Air Forces faces when attempting to recruit and retain officers compared to enlisted personnel. The cost differential between Air Force RPA pilots and Army UAS operators was also explored in the literature review. Command authority was examined in the literature review because some Air Force officers believe command authority is necessary for RPA pilots. The researcher also reviewed the declining DoD budget. Lastly, an article on fatigued RPA pilots was explored in the literature review because RPA pilots fly about 900 hours per year.

Force Requirements for Remote Piloted Aircraft Pilots

The Air Force's effort to meet combatant command RPA requirements has included some elements of strategic human-capital planning but increasing demand and experience indicate the Air Force has not accurately identified RPA personnel requirements. High-performing organizations use strategic human-capital planning to help them evaluate the extent to which their human-capital planning to help them evaluate the extent to which their human-capital approaches support the accomplishment of programmatic goals (GAO 2014, 4-45). The Air Force has taken steps to plan for the shape and size of the RPA pilot workforce and reacted to requirements from the Secretary of Defense. This would include adding a cadre of experienced officers to mentor officers recruited into the new career field. In 2011, the Air Force permanently recategorized around 475 manned-aircraft pilots who were generally serving at the ranks of major and lieutenant colonel to serve as permanent RPA pilots. Until 2009, the Air Force relied solely on manned-aircraft pilots serving assignments as RPA pilots to fill personnel requirements. These actions included lengthening the assignments of manned-aircraft pilots in RPA squadrons and then extending those assignments indefinitely (GAO 2014, 4-45).

In 2009, the Air Force began assigning manned-aircraft training graduates to RPA assignments as their first assignment after completing UPT. In 2010, the Air Force established the RPA pilot career field. The Air Force has a dual strategy to meet its increasing need for RPA pilots: using manned-aircraft pilots and recruiting RPA pilots. The Air Force intends to build a cadre of dedicated RPA pilots, and projects that RPA

pilots will make up 90 percent of the RPA pilot workforce by FY 2022 (GAO 2014, 4-45).

Recruiting and Retention of Remote Piloted Aircraft Pilots

The Air Force face challenges recruiting and retaining officers to serve as RPA pilots because of a negative perception that some in the Air Force associate with flying RPAs. RPA pilots in some focus groups and a unit commander stated that some in the Air Force view flying RPAs negatively, resulting in a stigma (GAO 2014, 4-45).

One reason some view flying an RPA negatively is because flying a RPA does not require pilots to operate an aircraft while on board an aircraft in-flight. In addition, officials stated that overcoming this stigma is difficult because publicizing the work that RPA pilots do is often not feasible due to the classified nature of RPA missions. A report by the House Permanent Select Committee on Intelligence urged the Air Force to study the other military services' experiences with using enlisted personnel as RPA operators and evaluate whether this approach would degrade mission performance (GAO 2014, 4-45).

Indications suggest that the Air Force could face challenges retaining them in the future. The Air Force offered assignment incentive payments to RPA pilots since the career field was established in 2010. Despite the incentive payments, pilots in seven of ten focus groups indicated that retention of RPA pilots is or will be a challenge. In addition, pilots in some focus groups stated that they are considering their options for leaving active duty service in the Air Force to go to the Air National Guard, Air Force Reserve, or the private sector (GAO 2014, 4-45).

The promotion rates of RPA pilots were found to be below the average rate for active duty line officers on twenty of twenty-four officer promotion boards since 2006. RPA pilots were promoted below the average rate of manned-aircraft pilots on twenty-one of twenty-four boards. RPA pilots were promoted at the lowest rate of any career field on nine of the twenty-four boards and were promoted at the lowest 5 percent of the career fields that competed on five additional boards. The Air Force reported reasons for low RPA pilot promotions because RPA pilots completed professional military education at lower rates than average, RPA pilots completed advanced degrees at lower rates than average, and the process the Air Force uses to select RPA pilots. The Air Force documentation states, "lower quality pilots are generally sent to RPA squadrons" (GAO 2014, 4-45).

In August 2013, the Brookings Institute released a report by Colonel Bradley T. Hoagland that identified critical gaps in the Air Force's ability to recruit and retain RPA pilots. Hoagland reported that in 2012, the Air Force could fill only 82 percent of the open training slots for drone pilots. He also found that the promotion rate of a RPA pilot was 13 percent lower than that of manned aircraft pilots. Negative views of RPA pilots, low promotion rates, high work demands, and the negative work-life balance contribute to low recruiting and retention rates among RPA pilots (Gettinger 2015, 1-5).

Recruiting and Retention of Enlisted Personnel

Recruiting performance for enlisted personnel is principally measured in terms of meeting quantity and quality goals. Quantity goals are based on the projected need for new personnel each service must bring in over the course of the year to meet its congressionally authorized end strength. There are two principal goals: at least 90 percent

of new recruits are high school diploma graduates and at least 60 percent score above average on the Armed Forces Qualification Test. Quality goals are only for recruits without any previous military service. Retention performance for enlisted personnel is principally measured by meeting one or more quantity goals. For the active components, quantity goals are based on career phase and are stated in numerical terms. For the reserve components, retention is tracked via overall attrition rates, which measure the ratio of people who leave in a given year (Kapp 2013, 1-10).

In FY 2011 and FY 2012, all of the active components achieved their recruit quantity goals and recruit quality was very strong. Virtually all new recruits had high school diplomas, and nearly three-quarters scored above average on the Armed Forces Qualification Test. The Navy, Marine Corps, and Air Force experienced the highest recruit quality levels achieved since the beginning of the all-volunteer force in 1973. Retention also remained strong, with all of the services close to or exceeding their goals. Nearly all of the reserve components met or exceeded their quantity goals, while quality remained high (Kapp 2013, 1-10).

Costs of Officer Development

Measured in terms of costs to the DoD, the average cost of an academy graduate ranged from $153,000 to $229,000 in 1989. The average cost per commissionee under the Reserve Officers' Training Corps (ROTC) scholarship program was much lower, ranging from $53,000 to $58,000 in the three services. Officer Candidate School (OCS) and Officer Training School (OTS) costs per commissionee were much lower still, ranging between $15,000 and $20,000 for all three services. Costs differ among the service

academies because of the size of the physical plants, size of housing, and medical care for its faculties (Director CBO 1990, 1-9).

At most ROTC programs scholarships pay the cost of all tuition and fees, rather than the full cost of a college education that would be financed in part by institutional support from gifts, grants, governmental aid, and perhaps other sources. The cost of ROTC graduates is also lower because many ROTC students attend schools that cost less to operate than the academies. The service academies would fall at the upper end of institutions ranked by cost. Service academies incur costs that other colleges and universities do not bear: full pay for students, full room and board, and a full complement of military instruction in addition to a rigorous engineering curriculum (Director CBO 1990, 1-9).

Of the three principal commissioning programs, OCS/OTS is the least costly. A graduate of OCS or OTS costs the DoD, on average, 6 percent to 13 percent as much as an academy graduate and about one-quarter to one-third as much as an officer obtained through an ROTC scholarship. One reason for these differences is that the government may not pay for any of the college education of OCS/OTS graduates. In addition, the duration of OCS/OTS programs is much shorter than other commissioning programs, lasting a few months rather than two to four years (Director CBO 1990, 1-9).

Cost of Undergraduate Pilot Training and Undergraduate Remote Piloted Aircraft Training

Officials from the Headquarters Air Force and the Office of the Secretary of Defense stated that pay incentives are rarely used to recruit officers in the Air Force. Headquarters officials also stated that due to the current constrained budget environment

in which DoD and the federal government are operating, the Air Force would first prefer to exhaust the use of all nonmonetary options for improving recruiting before offering bonuses. As a result, the Air Force had to rely on manned-aircraft pilots to meet RPA pilot needs. This approach was not cost-effective because the Air Force spends an average of $557,000 per pilot on traditional UPT, compared to an average of $65,000 for URT (GAO 2014, 4-48).

Air Force Remote Piloted Aircraft Pilot Bonuses

An article by Mark Pomerleau stated the following proposals that the Air Force outlined its plan to implement bonuses for RPA pilots. First, the Air Force will provide bonuses of $15,000 per year beginning in FY 2016 for RPA pilots. Under this proposal, RPA pilots would be able to choose between a critical skills retention bonus of five years at $15,000 per year or nine years at $15,000 per year. The bonus is similar in value and commitment to what has been offered to aviators in the past. RPA pilots who choose either the five- or nine-year option would also be eligible to receive 50 percent payment upfront (Pomerleau 2015, 1-3).

The most critical challenge in this mission area is a shortage of RPA pilots and the UPT graduates are the fastest way to address the shortfall. To alleviate the growing pressure on overtaxed RPA crews the Air Force will draw exclusively from the UPT pipeline for one year. UPT should have about eighty graduates during this period (Pomerleau 2015, 1-3).

Cost of Enlisted Personnel Development

The services report that most recruits fail to complete basic training for medical reasons, including injuries and previously undisclosed physical or mental conditions, and other performance-related issues. The cost of recruiting new enlisted personnel averages about $11,000 each and the cost of initial entry training is $35,000. Additional cost is based on variable cost to include cost per graduate training course required for specific skill levels, initial travel, initial clothing issued, and pay and allowances for leave accrued during basic training and formal training (About.com 2016, 1).

The cost of UAS operator Advanced Individual Training is $65,000 per soldier. The base pay of a new private first class is $1,847 per month and by the time he or she is promoted to sergeant in four years their pay increases to $2,614.20 per month. Military pay charts for officers, warrant officers, and enlisted members, are subject to change. Every year the Defense Authorization Act includes a pay raise. The minimum annual raise in military basic pay is calculated using the Department of Labor's Employment Cost Index. A new chart is issued shortly before the start of the new year unless the government has difficulty agreeing on or passing the new Defense Authorization Act (DFAS 2016).

Army Unmanned Aerial Systems Operator Bonuses

On December 2010, the Army issued Military Personnel Message Number 10-307, Subject: Bonus Extension and Retraining (BEAR) Program. The objectives of the BEAR Program are to attract highly qualified soldiers in the rank of staff sergeant (E-6) and below who are currently serving in an over strength/balanced MOS to migrate into a critically short Selective Reenlistment Bonus (SRB) MOS (U.S. Army 2010).

The BEAR Program is designed to assist in force alignment. It allows eligible soldiers an opportunity to extend their enlistment for formal retraining into a shortage MOS that is presently in the SRB Program and, upon completion of retraining, to be awarded the new primary MOS, reenlist, and receive an SRB in the newly awarded primary MOS. The Army authorizes bonuses for 15W UAS operators from private first class through sergeant non-promotable. Depending on their additional obligation of service and tier level, a private first class could obtain from $1,300 (twelve to twenty-three months) to $29,700 (sixty or more months). A sergeant could obtain from $1,500 (twelve to twenty-three months) to $35,600 (sixty or more months) (U.S. Army 2010).

Command Authority

An article by Dave Blair, analyzed whether enlisted airmen deserve to become RPA pilots. Blair hypothesized that the position of pilot is tied to the ranked officer because the nature of tactical flying demands a certain degree of independent decision-making, and tactical aviation inherently involves the element of command. An RPA crew's accessibility to the crew makes the need for command authority more critical because other crew members will want to tell the pilot how to fly. The pilot will often need to use his rank to protect the initiative of the crew in order to accomplish the mission. The ability to utilize rank will also be important when RPA pilots are being rushed by the Air Operation Center when conducting strikes. Air Force commanders are required to use their judgment to interpret guidance in unexpected situations and as long as RPA pilots serve as lone hunters it is wise to invest in pilots who are also aircraft commanders (Blair 2015, 1-4).

Blair also stated that enlisted airmen are capable of becoming RPA pilots; however, it should only be through OTS. OTS should be used to commission RPA SOs into RPA pilots because the program has a great track record. OTS would target senior NCOs with bachelor's degrees. After these senior NCOs become RPA pilots and serve their first service commitment it would take them to the ten-year decision point, making it more likely they decide to commit for a career (Blair 2015, 1-4).

Lastly, Blair hypothesized that it would be wrong to allow enlisted airmen to become pilots because there should be equal work for equal pay. It would be an insult to ask airmen to do the work of a lieutenant or captain for the same responsibility and personal liability, while denying them the rank, authority, and benefits that come with that responsibility. Any program that offers less pay for more work cannot claim to be an opportunity and any program that does this cannot expect to have any reasonable amount of retention (Blair 2015, 1-4).

This literature suggests that enlisted airmen are capable of becoming RPA pilots if they become NCOs, obtain their bachelor's degree, and attend OTS. This data supports the hypothesis that enlisted airmen can pilot RPA. The problem remains that the lead-time to develop RPA pilots through OTS may not be fast enough to meet the future requirements. There will be rapid advances in RPA and UAS technology. Other non-friendly countries' technological advances may also create the need for more RPA pilots to defend against the threat of invasion. Especially since the future vision is for officers to become battle managers of RPAs. Multi-purpose and multi-role RPA will support the full range of military operations where operators control swarms of RPA from a common control system (USD AT&L 2012, 3-24).

The Pros and Cons of Enlisted Pilots

An article by Stephen Losey stated that the Air Force is taking a serious look at allowing enlisted airmen to fly RPAs. Air Force Chief of Staff General Mark Welsh and Air Force Secretary Deborah Lee James both agree that enlisted airmen are capable of flying RPAs, given the proper training. The Army already allows enlisted soldiers to fly its unmanned systems. It could save the government money by having lower paid enlisted airmen do the same jobs as RPA officers. This would also maximize the Air Force's talent pool in a different way. The Air Force is concerned that the pay differential between enlisted airmen and officers doing the same job could lead to disgruntlement. Another issue is that there are potential legal issues with allowing enlisted RPA pilots to release weapons in a combat zone (Losey 2015, 1-4).

Losey stated the Air Force is struggling to keep up with the demand for RPA pilots. Fighter pilots fly an average of 250 hours per year and RPA pilots fly about 900 hours per year. There is also a stigma of being less of a pilot than those who are actually in the cockpit. By allowing enlisted pilots to fill the role of RPA pilots, the Air Force would have to move less manned aircraft pilots into RPA positions against their will. This would help the Air Force retain pilots instead of driving them out into the civilian sector. Some enlisted airmen would be eager to fly RPAs because they would be serving their country in a new way and the job market for RPA pilots is very lucrative. According to Indeed.com, the average RPA pilot makes $104,000 (LeMieux 2014, 4).

There could be implications of having enlisted airmen release weapons from RPA. The law currently requires a commissioned officer to oversee the use of force by enlisted service members. Commissioned officers will need to be held accountable and

during a complex battlefield situation involving multiple enlisted pilots, each flying in a different area, would stretch an officer's attention in multiple directions with potentially dangerous results. Having one officer to oversee each NCO pilot could solve the problem, but at that point, it would be more efficient to have the officer fly the RPA himself. In the mid-1990s, the Air Force wanted to have enlisted pilots fly RPA, but was overruled by generals because of the deadly force issue (Losey 2015, 1-4).

This information supports the idea of allowing enlisted airmen to serve as RPA pilots. Senior Air Force officials agree that given the proper training, enlisted airmen are capable of flying RPAs. The Army already allows enlisted soldiers to operate UAS, and allowing enlisted airmen to pilot RPAs could save the Air Force money by not having to fill these positions with manned aircraft pilots. One issue is the pay differential between enlisted airman and officers serving as RPA pilots. It could create animosity between the groups. There is also the legal issue of authorizing enlisted airmen to operate lethal weapons. Having RPA officers manage enlisted RPA pilots could potentially solve the issue of pay differential. Allowing enlisted airmen to only fly missions for ISR without using lethal force would resolve the legal issue of using weapons (Losey 2015, 1-4).

Declining Defense Budget

In Todd Harrison's research he discovered that the Future Years Defense Program (FYDP) included with the base budget, exceeds the Budget Control Act (BCA) budget caps by roughly $116 billion over the next five years and $168 billion over ten years. The Obama Administration's FY 2015 budget requests a total of $560.4 billion in funding for the DoD, including $495.6 billion in the base discretionary budget, $6.2 billion in mandatory funding, and $58.6 billion in supplemental funding for Overseas Contingency

Operations (OCO). The base discretionary budget is roughly the same level as Congress enacted for FY 2014, which in real terms is a reduction of 1.7 percent. The Air Force's share of the budget increases to 28 percent by FY 2019 (22 percent excluding pass-through funding to other agencies), while the Navy's budget share stays roughly the same at twenty-nine percent. The Army's share of the budget falls to 23 percent, the lowest level since FY 1959, while defense-wide accounts remain at 20 percent, the highest level since the end of World War II (Harrison 2014, 1-30).

Personnel costs are just over half ($258 billion) of the DoD base budget in FY 2015, including $183 billion on pay and benefits for military personnel and $75 billion on pay and benefits for civilian employees. On a per person basis, the cost of active military personnel grew by 76 percent from FY 1998 to FY 2014. The FY 2015 budget aims to arrest this trend by proposing several reforms to the military compensation system and reducing the size of the force. The results from Harrison's research suggest that the defense budget is steadily declining while personnel costs are increasing. Allowing enlisted airmen to become RPA pilots could be a potential reform implemented to save tax payer dollars (Harrison 2014, 1-30).

Fatigued Remote Piloted Aircraft Pilots

It was hypothesized by Anthony Tvaryana and Glen MacPherson in their research that RPA with long endurance allow near-continuous operations, necessitating the implementation of shift work for crewmembers to provide the necessary manning of ground control stations. Shift work has a well-known association with fatigue, degraded work performance, and an increased risk for errors and accidents. The study found no significant reduction in reported fatigue despite prior modifications to the shift work

schedule to increase opportunities for recovery. Months of shift work, sleep quality, and disturbances in family and social activities were associated with overall fatigue scores (Tvaryanas and MacPherson 2009, 1-7).

Collectively, the results demonstrate a persistent problem with chronic fatigue in this study population, likely reflective of continued inadequate opportunities for recovery and restorative sleep. Serious public health concerns have been raised regarding the association between shift work and degraded work performance and in increased risk of errors and accidents. Some of these concerns were borne out in a study of shift-working MQ-1 Predator crewmembers that found increased fatigue, emotional exhaustion, and burnout relative to traditional aircrew from another "high-demand, low density" weapon system (Tvaryanas and MacPherson 2009, 1-7).

The results from Tvaryanas' and MacPherson's research suggest the number of RPA pilots should be increased to resolve the excessive shift work hours. Utilizing enlisted airmen to fly RPA could be an option to alleviate stress on the force. The RPA schoolhouse is currently producing a little over half of the required number of RPA pilots, due to a shortage of instructors because of the high operational demand for pilots. RPA pilots are flying four times the amount that manned pilots do, logging an average of 850 to 900 flight hours annually. RPA pilots fly six days in a row and are away from their families about thirteen hours a day. Maximizing the use of enlisted airmen as RPA pilots could drastically reduce the required hours for shift work. This could adversely improve the health and safety of the force by reducing fatigue and stress (Tvaryanas and MacPherson 2009, 1-7).

Conclusion

In conclusion, the collective body of research reviewed indicates that the Air Force has an issue with strategically managing their RPA pilot work force. The Air Force is spending large amounts of money on developing and training officers as RPA pilots instead of enlisted airmen. The cost of officer development is more expensive than the cost of enlisted development and the lead-time is shorter because a four-year degree is not required. The DoD defense budget is steadily decreasing while the cost of personnel is increasing. This would make it more advantageous to utilize enlisted airman to save funds. The Air Force also has multiple issues with recruiting and retaining officers who are RPA pilots because there is a negative stigma associated with being an RPA pilot instead of a fighter pilot. Additionally, RPA pilots have lower promotion rates in comparison to fighter pilots and higher work demands in comparison to fighter pilots. Lastly, RPA pilots have a difficult time balancing their work-life with family responsibilities. The Air Force believes that officers need to fill the role of RPA pilots because command authority is necessary, however enlisted soldiers in the Army operator UAS and command authority has not been an issue.

Summary

It is important to understand how an undermanned RPA pilot work force is negatively affecting the performance, recruitment, and retention of current RPA pilots. The lack of RPA pilots has caused additional stress and fatigue on RPA pilots. This manning crisis has also affected their quality of training because they lack the proper number of instructors. The RPA manning crisis created many challenges when attempting to properly sustain and maintain its force. However, the process of utilizing enlisted

airmen as RPA pilots would reduce their lead time and cost. Research suggests it is in the best interest of the Air Force to follow the Army's model of utilizing enlisted personnel as RPA pilots. The difficulties lie within policy constraints that dictate that officers are only allowed to operate RPAs.

CHAPTER 3

RESEARCH METHODOLOGY

The research methodology used in this thesis is documentation review. This allows for comprehensive and historical interpretation of the facts concerning the thesis. The information for this methodology already exists so no generation or outside collection of external data was required. One disadvantage inherent to this method was the requirement to clearly state what information was used and searched during the discovery phase of this thesis. Another disadvantage to this method is that the research is restricted to the data that already exists.

This thesis researches an area that is significantly important to the force structure of the U.S. military. Understanding factors that affect the size of the UAS and RPA communities is vital for influencing the factors that affect the size and capabilities of the U.S. military into the future. The larger implications of this thesis include understanding which factors influence RPA pilot manning requirements and how they affect the force sizing. Being able to articulate the manner in which these factors influence the size of the UAS and RPA communities are critical for the military to adequately determine risk and portray those risks to decision makers within the U.S. government.

The ability to quantify and explain risk is significant in implementing force structure decisions that reflect national security strategy. This thesis is unique because most of the literature available for research focuses on the cost of UAS operators versus RPA pilots and the promotions rates of RPA pilots. Many of the writers did not consider the options of leveraging civilian RPA pilots to support Air Force operations or cross-leveling UAS operators from other services to support Air Force operations. The writers

also refrained from focusing on reducing the number of required missions for Air Force RPA pilots.

This thesis was developed after researching the main reasons why the Air Force uses commissioned officers to fly RPAs instead of enlisted airmen. Legally there is nothing that states only officers can operate RPAs. Headquarters Air Force officials stated that prior to 2010, they decided to assign officers to serve as RPA pilots because they thought officers were more appropriate since RPAs fly in complex airspace, and, in some cases, fire missiles at adversaries (GAO 2014, 4-48).

Headquarters Air Force officials also stated that they have, at times considered the use of enlisted or civilian personnel but have not initiated formal efforts to evaluate whether using such populations would negatively affect the ability of the Air Force to carry out its missions. However, without an evaluation of the viability of using other sources of personnel, the Air Force may lack valuable information on whether additional options exist for meeting personnel requirements (GAO 2014, 4-48).

Each of the U.S. military services operates RPA differently. The Navy also assigns officers to pilot RPAs, and enlisted personnel to operate RPA sensors. However, the Navy has not established a separate career field for pilots who specialize in flying RPAs and instead assign pilots of manned aircraft to operate them. By contrast, the Army and Marine Corps have opted to assign enlisted personnel to fly RPAs and operate their sensors. In both the Army and Marine Corps, there is no distinction between the pilot and SO (GAO 2014, 4-48).

Authorizing enlisted RPA pilots is a subject of much debate. The Air Force is concerned that the pay differential between enlisted airmen and better-paid officers doing

the same job could lead to disgruntlement. There could be conflicts regarding supervision. Having enlisted RPA pilots release weapons in a combat zone could potentially present legal issues that must be worked through (Losey 2015, 1-4). The FAA could also create regulations that increase requirements for RPA pilots. The FAA divides UAS operators into two categories; operations requiring a pilot certificate and operations not requiring a pilot certificate. Pilot certificates are required for all operations approved for conduct in Class A, C, D, and E airspace. Operations do not require a pilot certificate if conducted solely within visual line of sight in Class G7 airspace, or the operation is conducted from a privately owned airfield, military installation, or off airport location (FAA 2016).

Considerations taken into account during the course of this thesis include the maturity of the URT for officers. The Air Force created the RPA pilot training pipeline in FY 2012 to help fast track and fix the current manning shortfall. Not enough quantitative data has been gathered to prove whether this RPA pipeline will be able to keep up with future demands. The current throughput is estimated at eighty graduates per year (GAO 2015, 1-37).

Retention of Remote Piloted Aircraft Pilots

The first step in this methodology was to analyze the actual RPA pilot requirement for the Air Force. Determining the requirement is challenging because emerging technologies are making it possible to have autonomous RPAs in the near future. To determine the number of RPA pilots, the Air Force Manpower Agency conducted a personnel requirements study for MQ-1 Predator squadrons in 2008 and

established the number of RPA crews required to fly one CAP for twenty-four hours, referred to as the crew ratio (GAO 2014, 4-48).

Based on the study, the Air Force concluded that the crew ratio for MQ-1 Predator squadrons would be 10:1, which calls for ten RPA pilots to sustain a Predator for twenty-four hours. In addition to the crew ratio, the Air Force used Air Force Instruction 38-201, *Management of Manpower Requirements and Authorizations,* to calculate the required number of additional pilots it needs for support positions such as commanders, and staff positions at various organizational levels including headquarters. Air Force retention of RPA pilots has become difficult for several reasons. Air Force members have negative views of RPA pilots, RPA pilots have lower promotion rates than other officers, RPA pilots have high work demands, and they have difficulty balancing their work-life (USD AT&L 2012, 3-24).

In determining the retention rate of RPA pilots, three promotion boards were studied: the rates of promotion to major for RPA pilots compared to other Air Force officer careers, 2006 to 2012; the rates of promotion to lieutenant colonel for RPA pilots compared to other Air Force officer careers, 2006 to 2012; and the rates of promotion to colonel for RPA pilots compared to other Air Force officer careers, 2006 to 2012. Promotion rates were low for RPA pilots during all three boards. Factors attributing to low RPA pilot promotion rates were a lack of professional military education, a lack of completed advanced degrees, and the process used to select RPA pilots. Air Force documentation states that lower quality pilots are generally sent to RPA squadrons. Additionally, analysis of answers from RPA focus groups were studied. To obtain the perspectives of RPA pilots related to retention the Government Accountability Office

(GAO), conducted ten focus group meetings with active duty RPA pilots during site visits to Beale, Cannon, and Creech Air Force Bases (USD AT&L 2012, 3-24).

Retention of Enlisted Personnel

The second step in this methodology was to analyze the actual retention data for active component enlisted personnel. In determining the retention data for active component personnel all service retention categories were studied from FY 2011 to FY 2012. The results are a continuation of a strong retention trend in the Army and Marine Corps. After some difficulties in FY 2008, the Air Force met, or nearly met, all of its reenlistment goals in FY 2009. It met, or nearly met, two of three reenlistment goals in FY 2010 (Kapp 2013, 1-10).

Its results for first-term reenlistments in FY 2010 were substantially below goal, but Air Force analysts point out that they were trying to reduce its force in order to stay under its end-strength limits. In FY 2011, the Air Force exceeded its goal for first-term and mid-career personnel, but was slightly short of its goal for career personnel, while in FY 2012 it exceeded all of its goals. The Navy exceeded its retention goals in FY 2009 by a comfortable margin, and by even larger margins in FY 2010 to FY 2012 (Kapp 2013, 1-10).

Cost Analysis

The cost of producing an RPA pilot is much greater than the cost of producing an UAS operator. RPA pilots are more expensive because of the four years of college required in order to commission as an officer. Recruiting, manning, and training are all long-lead items, especially regarding the funding to provide appropriate training

opportunities to meet requirements. The Air Force is struggling to develop a process by which the acquisition, personnel, and operations communities develop organizational, manning, and training requirements, and address issues as they arise. Air Force officials stated they could only train about 180 people a year and they need 300 a year trained. Around 240 pilots are leaving the program each year and the Air Force was only able to staff the training program with 63 percent of its required instructors (GAO 2015, 1-37).

Commissioning sources directly affect the cost of producing officers. The cost of academy graduates ranges from $153,000 to $229,000. The cost of ROTC graduates ranges from $53,000 to $58,000. The cost of OTC ranges from $15,000 to $20,000. After an Air Force RPA officer commissions, he or she will either attend traditional UPT or URT (Director CBO 1990, 1-9).

The cost of traditional UPT is $557,000 and the cost of URT is $67,000. The base pay of a new second lieutenant is $2,972.40 per month and by the time he or she is promoted to captain in four years their pay increases to $5,287.20 per month. The Air Force has also authorized an incentive bonus to retain RPA pilots. RPA pilots can accept either $15,000 per year to serve an additional five years or $15,000 per year to serve an additional nine years. On the high end of the spectrum, if an RPA pilot attends the Air Force Academy and attends the traditional URT, it will cost the government $786,000 to train one officer. On the low end of the spectrum if an RPA pilot attends OTC and attends undergraduate RPA training it will cost the government $82,000 to train one officer. If the officer chooses to accept the five-year incentive bonus it will cost the government $75,000 and if the officer chooses to accept the nine-year incentive bonus it will cost the government $135,000. This does not include the salary of the officer based on his or her

rank and time in service. The annual salary of a captain with four years of service is $63,446.40 (USD AT&L 2012, 3-24).

The Army uses a less expensive approach in order to produce enlisted UAS operators. It cost the Army $11,000 to recruit the UAS operator and $35,000 to send him or her to basic training for a total of $46,000. The Army then sends the UAS operator to Advanced Individual Training, which is similar to the URT for a cost of $65,000. On the high end of the spectrum, the total cost of producing a UAS operator is $111,000 compared to the high-end cost of producing an RPA pilot that attended the Air Force Academy and traditional UPT at a cost of $786,000. In comparison, the cost of producing a UAS operator is only 14 percent of the cost of producing a RPA pilot (About.com 2016).

The salaries of enlisted personnel are lower in comparison to officers and the lead-time is shorter because a college education is not required. The base pay of a new private first class is $1,847 per month and by the time he or she is promoted to sergeant in four years their pay increases to $2,614.20 per month. The Army has also authorized an incentive bonus to retain RPA pilots. A private first class can either accept a one-time bonus of $1,300 to serve an additional two years or $29,700 to serve an additional five years. A sergeant can either accept a one-time bonus of $1,500 to serve an additional two years or $35,600 to serve an additional five years. The annual salary of a sergeant with four years of service is $31,370.40 compared to the annual salary of a captain with four years of service earning $63,446.40 per year. The comparison of the spending between RPA pilots and UAS operators shows a huge difference in the amount of spending

between the Army and Air Force. A subsequent analysis of this spending and its effects on force structure should provide adequate evidence to draw conclusions (DFAS 2016).

Defense Budget

The DoD base discretionary budget reduced 1.7 percent from FY 2014 to FY 2015 and the FYDP exceeds the BCA budget caps by roughly $116 billion over the next five years and $168 billion over ten years. Additionally there has been a rise in the cost per service member. This includes $183 billion for pay and benefits of 1,308,600 active military personnel and 820,800 Guard and Reserve personnel. Additionally there is $75 billion for pay and benefits of 782,000 full-time equivalent civilian employees. The largest components of military personnel-related costs in DoD's budget are basic pay for active service members ($52 billion), the Defense Health Program ($32 billion), and allowances for housing and subsistence ($28 billion) (Harrison 2014, 1-30).

This research methodology should present a complete and nonbiased view of the factors affecting the Air Force's ability to strengthen their management of RPA pilots. The thesis statement requires a complete and thorough search of published historical data in order for a complete analysis to occur. This information could provide insights into factors that will continue to impact the manning requirements for RPA pilots. The conclusions that are found because of this thesis should be reasonably unbiased based on the depth of the two factors researched and the variety of the sources used.

CHAPTER 4

ANALYSIS

The analysis of this thesis was based on the study of RPA pilot retention, enlisted retention, costs of officers versus enlisted and the decreasing budget for DoD. The impacts of retention and cost for RPA pilots directly correlate to other factors such as quality of life for them and their families. The review of retention will include analysis of research conducted by the Air Force Personnel Center (AFPC). AFPC conducted analysis on the rates of promotion to Major, Lieutenant Colonel and Colonel for pilots of RPA compared to other Air Force officer careers from 2006 to 2012 (GAO 2014, 4-48). Retention of enlisted personnel was also analyzed by the Congressional Research Service. They conducted analysis on the retention rates of all services from FY 2011 to FY 2012 (Kapp 2013, 1-10).

The review of costs included analysis of the FY 2015 Defense Budget by Todd Harrison. He is the Senior Fellow for Defense Budget Studies at the Center for Strategic and Budgetary Assessments. The Center for Strategic and Budgetary Assessments analysis focuses on key questions related to existing and emerging threats to U.S. national security, and its goal is to enable policymakers to make informed decisions on matters of strategy, security policy, and resource allocation. Key areas addressed in the research include: the evolution of budget request, DoD outlays as a percent of gross domestic product, change in budget by service from FY 2014, military compensation budget share and cost per active service member, operation and maintenance funding in FY 2015, and FYPD projections versus actual budget authority (Harrison 2014, 1-30).

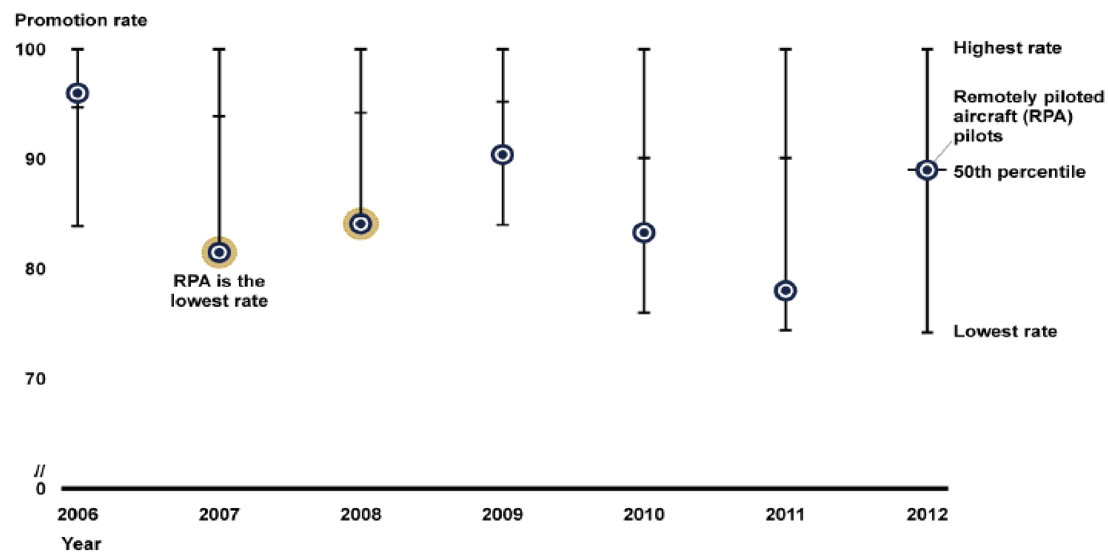
The thesis topic is to analyze why the Air Force is not utilizing their enlisted personnel to operate RPA. This topic is important because allowing enlisted airmen to operate RPA would reduce costs for DoD. Decreasing costs is vital because DoD has a shrinking defense budget. Improving the retention rates of RPA pilots is also important to ensure there are enough personnel to conduct CAPs in support of national security, and improved retention rates will reduce costs associated with training new pilots. During this research FAA regulations, force requirements, recruiting, command authority, and pilot fatigue were studied in order to give the researcher a greater breadth and depth of knowledge.

The data from the analysis shows that it would be in the Air Force's best interest to allow enlisted airmen to become RPA pilots. They would be able to fill their shortage of RPA pilots, reduce lead-time, decrease expenses for DoD, and improve retention rates. There are several types of charts and graphs displayed in the research for both retention and cost for RPA pilots.

Low Remote Piloted Aircraft Pilot Promotion Rates

The GAO compared the average promotion rate of RPA pilots to the average promotion rates of fighter, bomber, and mobility pilots combined. To identify the percentile of RPA pilot promotion rates compared to other Line of the Air Force officer career fields that competed on the promotion boards in the scope of their review, they analyzed the promotion rates of the active duty officers from all of the careers from the Line of the Air Force competitive category who competed on each promotion since 2006. For this analysis, the number of careers that competed on these promotion boards ranged from twenty-two to thirty-three. They excluded career fields if fewer than ten officers

competed for promotion from a given year, because the rate of promotion in these cases is highly sensitive to the outcomes of single officers. However, they included the results from eight promotion boards in which fewer than ten RPA pilots competed for promotion to provide a more comprehensive account of RPA pilot promotions. The promotion rate they calculated for instances when fewer than ten RPA pilots competed for promotion should be considered cautiously since the outcome of one or two officers could have a large effect on the overall rate for RPA pilots for those instances. The boards that included fewer than ten RPA pilots who competed for promotion are indicated in the notes to figures 1, 2, and 3 (GAO 2014, 4-48).

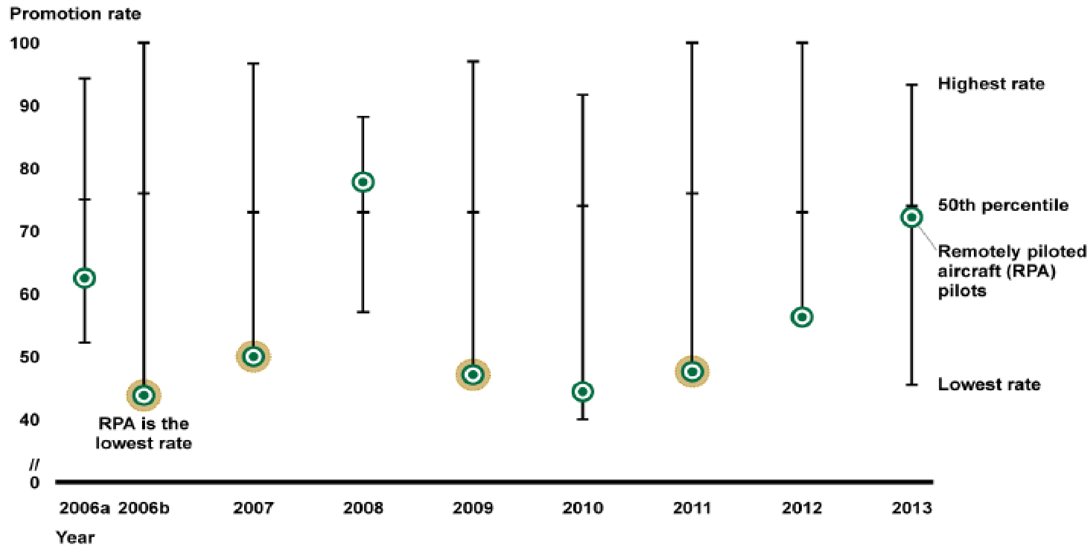


Source: GAO analysis of Air Force data.

Note: The Air Force did not hold a promotion board for Line of the Air Force majors in 2013. At least 10 eligible officers from between 29 and 33 careers competed, in the zone, for promotion to the rank of major in the Line of the Air Force competitive category between 2006 and 2012.

Figure 6. Rates of Promotion to Major

Source: U.S. Government Accountability Office, GAO-15-461, *Unmanned Aerial Systems Actions Needed to Improve DOD Pilot Training* (Washington, DC: U.S. Government Accountability Office, May 2015), Table 5.

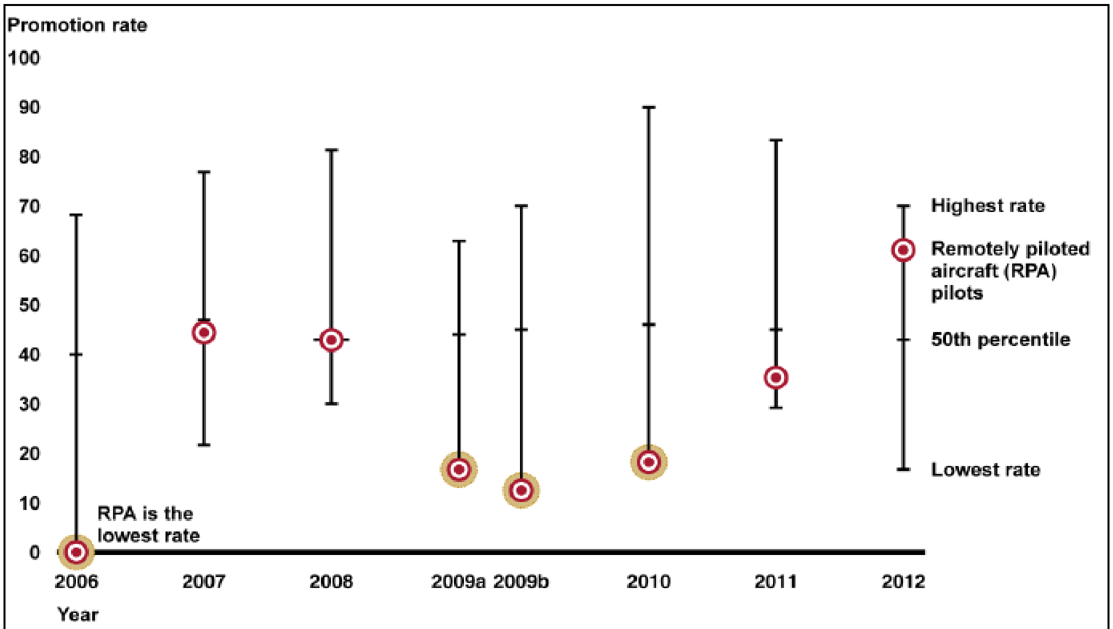


Source: GAO analysis of Air Force data.

Note: The Air Force held two promotion boards in 2006 for Line of the Air Force lieutenant colonels. Fewer than 10 RPA pilots were eligible for the 2006a, 2007, and 2008 promotion boards. At least 10 eligible officers from between 26 and 30 careers competed, in-the-zone, for promotion to the rank of lieutenant colonel in the Line of the Air Force competitive category between 2006 and 2013.

Figure 7. Rates of Promotion to Lieutenant Colonel

Source: U.S. Government Accountability Office, GAO-15-461, *Unmanned Aerial Systems Actions Needed to Improve DOD Pilot Training* (Washington, DC: U.S. Government Accountability Office, May 2015), Table 6.



Source: GAO analysis of Air Force data.

Note: The Air Force held two promotion boards for Line of the Air Force colonels in 2009. Also, the Air Force held a promotion board for Line of the Air Force colonels in November 2013, but the results were not available as of February 2014. Fewer than 10 RPA pilots were eligible for the 2006, 2007, 2008, 2009a, and 2009b promotion boards. At least 10 eligible officers from between 22 and 26 careers competed, in-the-zone, for promotion to the rank of colonel in the Line of the Air Force competitive category between 2006 and 2012.

Figure 8. Rates of Promotion to Colonel

Source: U.S. Government Accountability Office, GAO-15-461, *Unmanned Aerial Systems Actions Needed to Improve DOD Pilot Training* (Washington, DC: U.S. Government Accountability Office, May 2015), Table 6.

The AFPC analyzed data of officers in the competitive category that includes RPA pilots called Line of the Air Force and found multiple factors related to promotion outcomes. Specifically, AFPC analyzed these data using logistic regression, which is a statistical method that enables AFPC to analyze the relationships among multiple factors. Using this method, AFPC identified a number of factors that are positively and negatively related to promotions (GAO 2014, 4-48).

AFPC found that one of the two factors with the most substantial positive relationship to promotions was for an officer to have completed a professional military education program by attending an Air Force school in-residence, rather than completing the same professional military education program by correspondence. The other factor with the most-substantial positive relationship was for an officer to have completed an advanced academic degree. AFPC found that RPA pilots generally completed professional military education in-residence and advanced degrees at lower rates compared to the average rates for officers who had been promoted since 2006 (GAO 2014, 4-48).

Additionally, Headquarters Air Force officials and two commanders of manned-aircraft squadrons explained that commanders select pilots from their squadrons to assign to RPA squadrons and in general, most commanders assign less-skilled pilots and less-competent officers to these squadrons. Because the bulk of RPA pilots who have competed for promotion since 2006 were assigned using this process, they believe these are the reasons that RPA pilots have been promoted at lower rates (GAO 2014, 4-48).

High Retention Rates for Enlisted Personnel

Several factors have made retention of enlisted personnel favorable. Historical data indicate that the high unemployment rate dropped from 2003 through 2007 and then climbed from 2008 to 2010. Another factor was likely the cumulative effect of the substantial increases in military compensation that have occurred over the past decade or so. In most years between FY 2001 and FY 2010, Congress increased basic pay by an amount that was at least 0.5 percent higher than the annual increase in the employment cost index. Congress initiated a multi-year reform of housing allowances between FY

1998 and FY 2005 to raise housing allowance rates in order to bring them in line with actual housing costs. Congress also increased the amount of hostile fire pay and family separation allowance in 2002, authorized premium-based TRICARE coverage for non-activated Reservists in 2006, and enacted a generous new educational benefit in 2008. One more factor was the completion of the major multi-year efforts by the Army and Marine Corps to increase their personnel strength (Kapp 2013, 1-10).

Table 1. Accession Data (Quantity) for Active Component Enlisted Personnel, FY2011 and FY2012

Service	FY2011 (Goal)	FY2011 (Achieved)	FY2011 (Percent of Goal)	FY2012 (Goal)	FY2012 (Achieved)	FY2012 (Percent of Goal)
Army	64,000	64,019	100.0%	58,000	60,490	104.3%
Navy	33,400	33,444	100.1%	36,275	36,329	100.1%
Marine Corps	29,750	29,773	100.1%	30,500	30,514	100.0%
Air Force	28,515	28,518	100.0%	29,037	29,037	100.0%

Figure 9. Accession Data (Quantity) for Active Component Enlisted Personnel, Fiscal Year 2011 and Fiscal Year 2012

Source: Lawrence Kapp, *Recruiting and Retention: An Overview of FY2011 and FY2012 Results for Active and Reserve Component Enlisted Personnel* (Washington, DC: Library of Congress, May 10, 2013), accessed May 19, 2016, ProQuest Dissertations and Theses, Table 1.

Table 5. Retention Data for Active Component Enlisted Personnel, FY2011 and FY2012

Service/ Retention Category	FY2011 (Goal)	FY2011 (Achieved)	FY2011 (Percent of Goal)	FY2012 (Goal)	FY2012 (Achieved)	FY2012 (Percent of Goal)
Army[a]						
Initial Term	16,848	17,674	104.9%	27,293	29,606	108.5%
Mid Career	15,608	17,104	109.6%	23,162	22,982	99.2%
Career	7,544	8,848	117.3%	11,345	11,430	100.7%
Navy[b]						
Zone A	13,990	17,884	127.8%	5,850	6,154	105.2%
Zone B	8,239	9,536	115.7%	4,612	4,362	94.6%
Zone C	5,064	7,168	141.5%	2,225	3,284	147.6%
Air Force[c]						
Zone A	14,602	15,368	105.2%	15,927	18,071	113.5%
Zone B	9,791	10,340	105.6%	9,543	10,948	114.7%
Zone C	8,959	8,591	95.9%	8,315	8,761	105.4%
Marine Corps[d]						
First Term	6,832	6,870	100.1%	6,266	6,251	99.8%
Subsequent	6,537	8,455	129.3%	6,800	6,989	102.8%

Figure 10. Retention Data for Active Component Enlisted Personnel,
Fiscal Year 2011 and Fiscal Year 2012

Source: Lawrence Kapp, *Recruiting and Retention: An Overview of FY2011 and FY2012 Results for Active and Reserve Component Enlisted Personnel* (Washington, DC: Library of Congress, May 10, 2013), accessed May 19, 2016, ProQuest Dissertations and Theses, Table 5.

Defense Budget

The budget appears to be roughly $20 billion short over the FYDP. The budget also assumes many savings that are unlikely to materialize in future years. Efficiency savings have been included in successive budget requests, now totaling hundreds of billions over the FYDP. The budget also assumes savings from the proposed changes to military compensation, totaling roughly $31 billion over the FYDP. If some portion of

these savings does not materialize as anticipated, the defense program will be further under-resourced (Harrison 2014, 1-30).

To execute the defense program and support the strategy and force levels detailed in the *Quadrennial Defense Review* and *Defense Strategic Guidance,* DoD could require $200-$300 billion over the FYDP than the BCA budget caps currently allow. The shortfall could be more or less depending on the success of DoD’s efficiency initiatives, the willingness of Congress to enact some of the proposed changes to military compensation, and the ability of DoD to continue using OCO funding to offset reductions in the base budget. If the budget caps are not raised by Congress, DoD will be forced to fund this shortfall by making additional cuts to force structure, personnel, acquisitions, and readiness beyond what is proposed in the request meaning greater risk in executing the defense strategy (Harrison 2014, 1-30).

Base Defense Budget

The ten-year projection for the base DoD budget has declined with each president’s budget submission since the FY 2012 request. The largest change occurred in the FY 2013 request, with the ten-year projection falling by roughly $500 billion from what had previously been projected over the same period. The FY 2014 request called for further reductions, most of which were back-loaded near the end of the ten-year period. In contrast, the reductions in the FY 2015 request are front-loaded, with the largest reduction relative to last year’s projection occurring in the first year (Harrison 2014, 1-30).

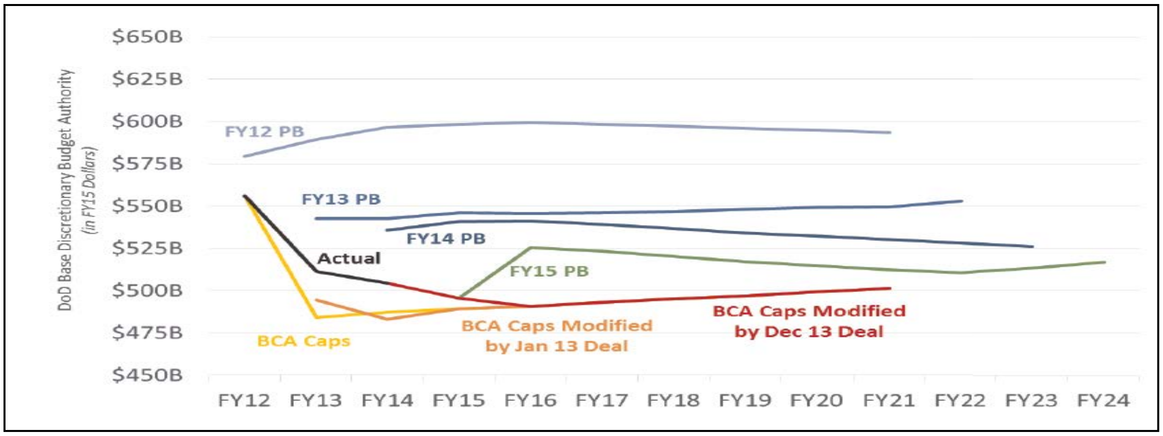


Figure 11. Evolution of Budget Requests and Budget Caps since 2011

Source: Todd Harrison, "Analysis of the FY 2015 Defense Budget," Center for Strategic and Budgetary Assessments, September 4, 2014, accessed February 28, 2016, http://csbaonline.org/publications/2014/09/analysis-of-the-fy2015-defense-budget/.

Historical Perspective

Defense spending expressed as a percent of gross domestic product is useful to understand whether the level of spending is affordable by historical standards or how U.S. defense spending compares to the share of economic output other countries spend on defense. Since FY 1976, defense spending has averaged 21 percent of total federal spending, or 20 percent excluding OCO funding. In FY 2014, DoD's budget was 16.3 percent of federal spending, or 13.6 percent of OCO funding. This compares to 23 percent for Social Security, 14 percent for Medicare, and 6 percent for net interest on the national debt, the other major components of the federal budget. These metrics indicate that while defense spending is at a relatively high absolute level by historical standards, it is shrinking as a portion of overall federal spending (Harrison 2014, 1-30).

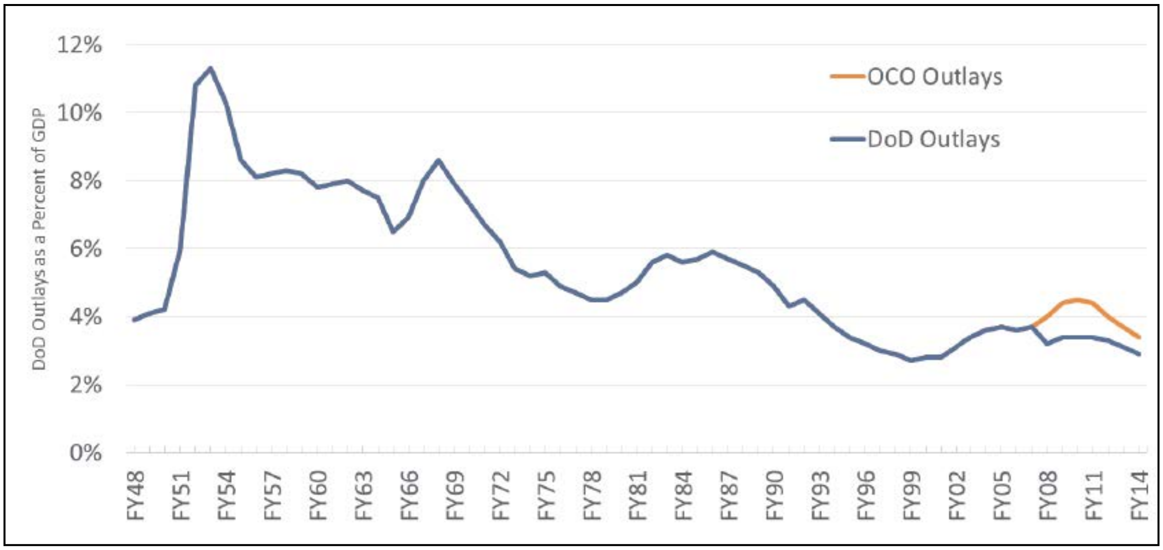


Figure 12. Department of Defense Outlays as a Percent of Gross Domestic Product

Source: Todd Harrison, "Analysis of the FY 2015 Defense Budget," Center for Strategic and Budgetary Assessments, September 4, 2014, accessed February 28, 2016, http://csbaonline.org/publications/2014/09/analysis-of-the-fy2015-defense-budget/.

Trends in the Department of Defense Base Budget and Future Years Defense Program

Military personnel funding fell by 2.0 percent in FY 2015 and continues declining at a rate of 1.6 percent annually through FYDP due to the compensation reform proposals included with the request and planned reductions in end strength. The procurement and research, development, test, and evaluation accounts decline in FY 2015 by 3.9 percent and 0.5 percent, then increase by 17 percent and 7 percent, in FY 2016. Funding for military construction and family housing also drops sharply in FY 2015 before recovering in FY 2016 (Harrison 2014, 1-30).

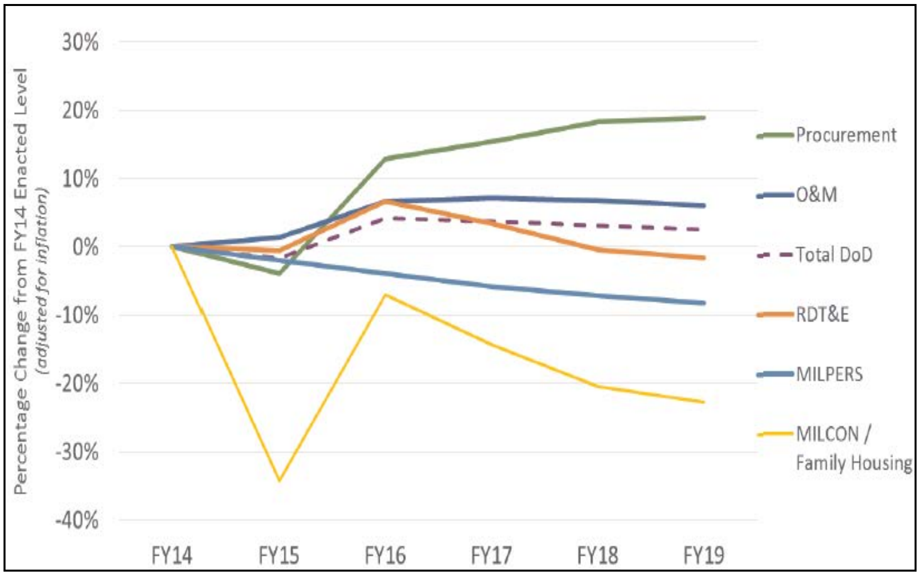


Figure 13. Change in Budget by Title from the FY 2014 Enacted Level

Source: Todd Harrison, "Analysis of the FY 2015 Defense Budget," Center for Strategic and Budgetary Assessments, September 4, 2014, accessed February 28, 2016, http://csbaonline.org/publications/2014/09/analysis-of-the-fy2015-defense-budget/.

Air Force's Budget

The Air Force is the only service to receive a real increase (0.6 percent) in FY 2015 with a much larger increase (8.6 percent) planned for FY 2016. The Air Force budget includes both a "blue" portion that directly funds Air Force programs and activities and a "non-blue" portion that funds classified activities that pass through the Air Force to other agencies. When the pass-through is excluded, the "blue" portion of the Air Force budget declines by 1.2 percent in FY 2015 and then rises by 9.0 percent in FY 2016 (Harrison 2014, 1-30).

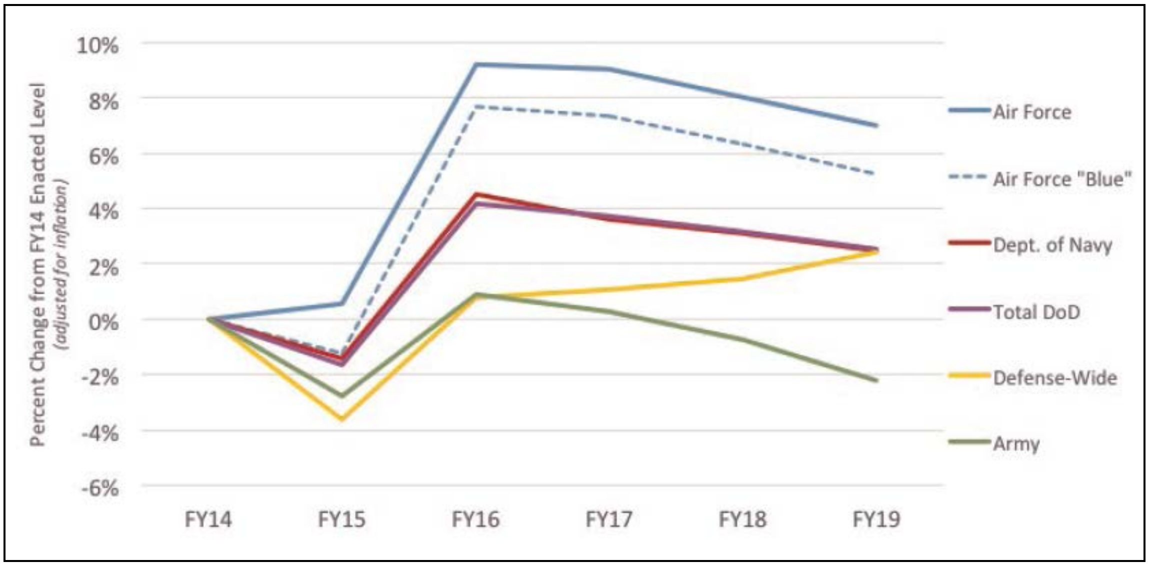


Figure 14. Change in Budget by Service from the FY 2014 Enacted Level

Source: Todd Harrison, "Analysis of the FY 2015 Defense Budget," Center for Strategic and Budgetary Assessments, September 4, 2014, accessed February 28, 2016, http://csbaonline.org/publications/2014/09/analysis-of-the-fy2015-defense-budget/.

<u>Personnel</u>

Personnel costs were just over half ($258 billion) of the DoD base budget in FY 2015. This includes $183 billion for pay and benefits of 1,308,600 active military personnel and 820,800 Guard and Reserve personnel as well as $75 billion for pay and benefits of 782,000 full-time equivalent civilian employees. Military personnel costs have risen significantly. On a per person basis, the cost of active military personnel grew by 63 percent during the upward phase of this budget cycle. Since the budget peaked in FY 2010, costs have continued growing, bringing the total growth in the cost per active service member to 76 percent from FY 1998 to FY 2014 (Harrison 2014, 1-30).

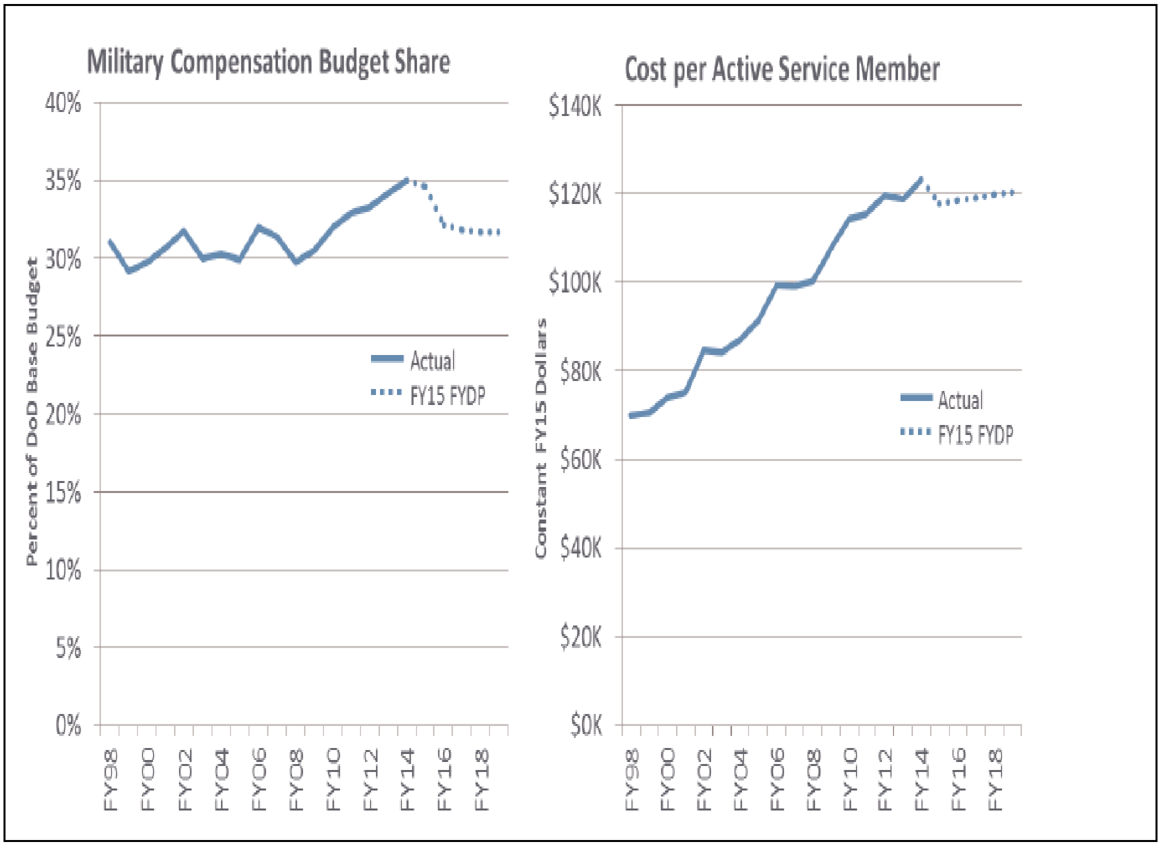


Figure 15. Military Compensation Budget Share and Cost per Active Service Member

Source: Todd Harrison, "Analysis of the FY 2015 Defense Budget," Center for Strategic and Budgetary Assessments, September 4, 2014, accessed February 28, 2016, http://csbaonline.org/publications/2014/09/analysis-of-the-fy2015-defense-budget/.

BASIC PAY—EFFECTIVE JANUARY 1, 2016											
Gr	2 or less	Over 2	Over 3	Over 4	Over 6	Over 8	Over 10	Over 12	Over 14	Over 16	Over 18
O-10											
O-9											
O-8	9,946.20	10,272.00	10,488.30	10,548.60	10,818.60	11,269.20	11,373.90	11,802.00	11,924.70	12,293.40	12,827.10
O-7	8,264.40	8,648.40	8,826.00	8,967.30	9,222.90	9,475.80	9,767.70	10,059.00	10,351.20	11,269.20	12,043.80
O-6	6,267.00	6,885.30	7,337.10	7,337.10	7,365.00	7,680.90	7,722.30	7,722.30	8,161.20	8,937.00	9,392.70
O-5	5,224.50	5,885.70	6,292.80	6,369.60	6,624.00	6,776.10	7,110.30	7,356.00	7,673.10	8,158.50	8,388.90
O-4	4,507.80	5,218.20	5,566.50	5,643.90	5,967.00	6,313.80	6,745.80	7,081.50	7,314.90	7,449.30	7,526.70
O-3	3,963.60	4,492.80	4,849.20	5,287.20	5,540.70	5,818.80	5,998.20	6,293.70	6,448.20	6,448.20	6,448.20
O-2	3,424.50	3,900.30	4,491.90	4,643.70	4,739.40	4,739.40	4,739.40	4,739.40	4,739.40	4,739.40	4,739.40
O-1	2,972.40	3,093.90	3,740.10	3,740.10	3,740.10	3,740.10	3,740.10	3,740.10	3,740.10	3,740.10	3,740.10
O-3				5,287.20	5,540.70	5,818.80	5,998.20	6,293.70	6,543.30	6,686.70	6,881.40
O-2				4,643.70	4,739.40	4,890.30	5,145.00	5,341.80	5,488.50	5,488.50	5,488.50
O-1				3,740.10	3,993.60	4,141.50	4,292.40	4,440.60	4,643.70	4,643.70	4,643.70
W-5											
W-4	4,095.90	4,406.10	4,532.40	4,656.90	4,871.10	5,083.20	5,298.00	5,620.80	5,904.00	6,173.40	6,393.90
W-3	3,740.40	3,896.40	4,056.30	4,108.80	4,276.20	4,605.90	4,949.10	5,110.80	5,297.70	5,490.30	5,836.50
W-2	3,309.90	3,622.80	3,719.40	3,785.40	4,000.20	4,333.80	4,499.10	4,661.70	4,860.90	5,016.30	5,157.30
W-1	2,905.50	3,218.10	3,302.10	3,479.70	3,690.00	3,999.60	4,144.20	4,346.10	4,545.00	4,701.60	4,845.30
E-9							4,948.80	5,060.70	5,202.30	5,368.20	5,536.20
E-8						4,050.90	4,230.00	4,341.00	4,473.90	4,618.20	4,878.00
E-7	2,816.10	3,073.50	3,191.40	3,347.10	3,468.90	3,678.00	3,795.60	4,004.70	4,178.70	4,297.50	4,423.80
E-6	2,435.70	2,680.20	2,798.40	2,913.60	3,033.60	3,303.30	3,408.60	3,612.30	3,674.40	3,719.70	3,772.50
E-5	2,231.40	2,381.40	2,496.60	2,614.20	2,797.80	2,989.80	3,147.60	3,166.20	3,166.20	3,166.20	3,166.20
E-4	2,046.00	2,150.40	2,267.10	2,382.00	2,483.40	2,483.40	2,483.40	2,483.40	2,483.40	2,483.40	2,483.40
E-3	1,847.10	1,963.20	2,082.00	2,082.00	2,082.00	2,082.00	2,082.00	2,082.00	2,082.00	2,082.00	2,082.00
E-2	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50	1,756.50
E-1	1566.90										

Figure 16. Military Pay Chart to Display Difference in Salaries of Officers and Enlisted Personnel

Source: Defense Finance and Accounting Service, “Military Pay Charts, 1949-2016,” accessed February 19, 2016, www.dfas.mil/militarymembers/payentitlements/military-pay-charts.

Conclusion

The Air Force’s shortage of RPA pilots is causing some underlying issues to emerge. These issues include overworked RPA pilots who find it difficult to complete their professional military education programs by attending Air Force schools in-residence. Additionally, overworked officers have found it difficult to complete their advanced academic degrees due to their amount of flight hours. These factors have

negatively affected promotion rates of RPA pilots. The lower promotion rates and longer work hours of RPA pilots are negatively affecting the retention of RPA pilots (GAO 2014, 4-48).

RPA pilots believe they are limited in pursuing developmental opportunities. Some RPA pilots believe their high work demands have placed extra stress on their families and social lives. Because there is a shortage of RPA pilot instructors some RPA pilots believe they are not receiving the quality and quantity of training needed. Lastly, RPA pilots believe retaining RPA pilots is currently a problem and will continue to be a problem unless changes are made in the future (GAO 2015, 1-37).

One change could include filling the shortage of RPA pilots with enlisted airmen. Enlisted airmen are less expensive than using commissioned officers, they have high retention rates and it would drastically reduce the lead time of filling manning shortages. Reducing costs is important because the DoD could require $200-$300 billion over the FYDP than the BCA budget caps currently allow. Since FY 1976, defense spending has decreased from 20 percent to 13.6 percent. Additionally, military personnel funding fell from 2.0 percent in FY 2015 and it declined at a rate of 1.6 percent annually through FYDP. With the defense budget decreasing annually and the cost of active military personnel rising, it would be in the Air Force’s best interest to allow enlisted airmen to operate RPA (Harrison 2014, 1-30).

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

U.S. Air Force Manning Shortage

RPA pilot requirements for the Air Force increased in FY 2011 from 1,696 to 2,060 in FY 2015. The U.S. Army's manpower requirement for UAS operators also increased in FY 2011 from 1,456 to 2,057 in FY 2015. This occurred because of increased numbers of CAP missions. Currently the Air Force only allows commissioned officers to fly RPAs (GAO 2015, 1-37).

The recruiting, manning, and training of officers to become RPA pilots are long lead items. The Air Force's lack of RPA pilots caused a manning crisis. In order to deal with the manning crisis the Air Force created URT for RPA pilots with the 18X AFSC as well as a distinct training pipeline for RPA SOs with the 1U AFSC (GAO 2015, 1-37).

The Army did not have a manning problem because enlisted soldiers have a shorter lead-time in order to become UAS operators. Enlisted soldiers in the Army are authorized to operate and fly UAS, operate sensors, and emplace/displace the systems, and the use of enlisted soldiers to operate UAS in the Army has not degraded mission performance. The shortage of RPA pilots in the Air Force has negatively affected RPA pilot retention. Additionally, only allowing officers to become RPA pilots requires a longer lead-time and it is a less cost effective approach (GAO 2014, 4-48).

Relevance Justification

The researcher concludes that the results of the analysis correlate with the problem statement that the Air Force is struggling to keep up with the demand for RPA

pilots. The U.S. Air Force's requirements for RPA pilots increased from 1,696 in FY 2011 to 2,060 in FY 2015. The recruiting, manning, and training of officers are long lead items. The Air Force's number of required CAPs has increased but they do not have enough RPA pilots to keep up with the demand to conduct operations. The results from GAO's focus group meetings with RPA pilots show that the majority of RPA pilots believe there is a manning shortage of RPA pilots, and there is a problem with retaining RPA pilots. Because of these constraints, RPA pilots work longer hours than fighter jet pilots work and find it difficult to complete their professional military education and advanced degrees (GAO 2014, 4-48).

The researcher hypothesized that if enlisted airmen were authorized to become RPA pilots it would eliminate the RPA manning crisis, improve retention rates for RPA pilots, and reduce the cost of DoD spending for military personnel funding. The analysis of GAO's RPA pilot focus groups and the analysis of the FY 2015 defense budget suggest the researcher's theory. The information gathered from the review of the literature supports the analysis by explaining the following: why the force requirements for RPA pilots increased; the recruiting and retention challenges of RPA pilots; the high retention rate of enlisted personnel; the expensive cost of officer development; the expensive cost of UPT; the cost of URT; the expensive cost associated with Air Force RPA pilot bonuses; the lower cost associated with enlisted personnel development; the lower cost associated with Army UAS operator bonuses; the command authority associated with RPA pilots; the pros and cons of enlisted pilots and the problems associated with fatigued RPA pilots.

The information from the review of literature also provides reasons why the Air Force has a manning shortage of RPA pilots. The review of the literature also acknowledges that the Air Force has a shortage of RPA pilot instructors, which limits the throughput of students from the URT Program. Finally, the review of the literature supports the idea that RPA pilots work longer hours than fighter pilots do and this has negatively affected the promotion rates of RPA pilots.

Thesis Question

Given the Air Force's shortage of RPA pilots, why has the Air Force refused to allow enlisted airmen to operate RPA? The Air Force assigns various types of officers to serve as RPA pilots including temporarily re-assigned manned-aircraft pilots, manned-aircraft pilots and other Air Force aviation officers who have converted to the RPA pilot career permanently, graduates of manned-aircraft pilot training on their first assignment, and pilots who specialize in flying RPA with limited manned-aircraft experience. Headquarters Air Force officials stated that prior to 2010, they decided to assign officers to serve as RPA pilots because they thought officers were more appropriate since RPAs fly in complex airspace, and, in some cases, fire missiles at adversaries. However, due to the increased requirements for additional RPA pilots the Air Force has a manning shortage, which has created an overworked RPA pilot force. The overworked force has found it difficult to complete their professional military education and advanced degrees. This in turn has caused them to have lower promotion rates, which negatively affect retention rates.

Findings

After analyzing and interpreting the data from RPA pilots' rates of promotion between 2006 and 2012, results of GAO analysis from focus group meetings with RPA pilots, and analysis of the FY 2015 defense budget, the researcher found that an overwhelming number of RPA pilots across the U.S. Air Force believe that promotion is difficult to achieve as an RPA pilot and retaining RPA pilots has become a problem. The researcher also believes that it if enlisted airmen were authorized to become RPA pilots it would eliminate the shortage of RPA pilots in the U.S. Air Force. The researcher concludes that authorizing enlisted airmen to come RPA pilots would save DoD millions of dollars in military personnel funding and improve the retention of RPA pilots. This is important because military personnel funding has decreased annually.

The excess work hours of RPA pilots have contributed to their lack of professional military education and their lack of advance degree completion. This has led to lower promotion rates, which negatively affect retention rates. This dissatisfaction has caused 240 RPA pilots to leave the Air Force each year. Authorizing enlisted RPA pilots would eliminate the RPA pilot-manning crisis and reduce the cost of DoD's defense budget.

Recommendations

Based on the data collected from the review of literature there is a critical need for the Air Force to increase their number of RPA pilots. Unfortunately, the hierarchy of bureaucracy has not allowed them to open up this career path for enlisted airmen. The U.S. Army already allows enlisted soldiers to operate their UAS and it has not degraded the performance of their missions. The researched demonstrated that the process of

developing an officer to become an RPA pilot is more costly and lengthy than developing an enlisted soldier to become an RPA pilot.

The U.S. Air Force must conduct a manpower study on the viability of allowing enlisted airmen or civilian personnel to become RPA pilots. This will eliminate the manning shortage of RPA pilots, reduce their current workload, allow officers to complete their professional military education and advanced degrees, reduce stress and fatigue, improve retention rates, and reduce the cost associated with military personnel funding.

The Secretary of Defense must direct the Secretary of the Air Force to develop a recruiting and retention strategy that is tailored to the specific needs and challenges of RPA pilots to help ensure that the Air Force can meet and retain required staffing levels to meet its mission. Additionally, retention methods like the Air Force's annual Aviation Retention Pay program must be utilized for the 18X specialty-coded RPA pilots in future years (GAO 2014, 4-48).

The Secretary of Defense must direct the Secretary of the Air Force to include the career field effect of being an RPA pilot into AFPC's analysis to determine if the factors AFPC identified in its analysis of Line of the Air Force officers are also related to RPA promotions (GAO 2014, 4-48).

The Secretary of Defense must direct the Secretary of the Air Force to update crew ratios for RPA units to ensure that the Air Force establishes a more accurate understanding of the required number of RPA pilots needed in its units. Having the correct ration of crew members to missions flown will greatly facilitate the growth and development of the RPA career field (GAO 2014, 4-48).

The Secretary of Defense must direct the Secretary of the Air Force to establish a minimum crew ratio in Air Force policy below which RPA cannot operate without running unacceptable levels of risk to accomplishing mission and ensuring safety. RPA units are deployed-on-station providing no quantitative metric when a deploy-to-dwell threshold is crossed. Establishing a minimum crew ratio would provide clear service redlines for use when the Air Force receives a request for forces (GAO 2014, 4-48).

The Secretary of Defense must direct the Secretary of the Air Force to incorporate feedback from RPA pilots by using existing mechanisms or by collecting direct feedback from RPA pilots. Consideration should be given to assess whether Air Force Unit Climate Assessments and other similar surveys are appropriate to collect feedback from RPA pilots (GAO 2014, 4-48).

The Secretary of Defense must direct the Secretary of the Air Force to analyze the effects of being deployed-on-station to determine if there are resulting negative effects on the quality of life of RPA pilots and take responsive actions as appropriate. Many stressors could likely be addressed with personnel solutions of increased crew ratios (GAO 2014, 4-48).

Summary

DoD's RPA and UAS have become a critical component of military operations. Because of the expanding roles of RPA and UAS DoD increased the Air Force's and Army's manning requirements in order to support CAP operations. The Army was able to meet their manning requirements with enlisted soldiers but the Air Force was not able to meet their manning requirements because their RPA pilots are officers who require a longer lead-time for development. This has caused the Air Force to operate below its

optimum crew ratio. High demands on RPA pilots have limited the time they have available for training and development and negatively affects their work life.

Findings from the research indicate that RPA pilots believe they are overworked and that the Air Force is having and will continue to have issues retaining RPA pilots until the manning issue is resolved. The research also indicates that the defense budget and the budget for military personnel are decreasing annually. Using enlisted airmen as RPA pilots instead of officers would save DoD millions of dollars and improve retention rates for RPA pilots.

Conclusions

There is tremendous growth and development of RPA and UAS platforms on the battlefields. However, the Air Force is facing challenges identifying the right personnel to fill needs for RPA pilots. In 2008, the Air Force determined the optimum number of RPA pilots to crew ratio for some units, but it did not account for additional tasks units would have to complete. Additionally, because there was as increase in CAPs the U.S. Air Force's requirements for RPA pilots increased from 1,696 in FY 2011 to 2,060 in FY 2015.

Once the Air Force's manning requirements were increased, they were not able to fill the requirements. The Air Force's requirement for officers has a long lead-time. This resulted in an overworked RPA pilot workforce. RPA pilots fly about 900 hours per year compared to fighter pilots who fly an average of 250 hours per year. Additionally the Air Force had a shortage of instructors who taught future RPA pilots in the UTP.

The U.S. Army's manpower requirement for UAS operators also increased in FY 2011 from 1,456 to 2,057 in FY 2015. The Army was able to fill their manpower

requirement because they allow enlisted soldiers to operate their UAS. The training and development of enlisted Army UAS operators is considerably shorter and less expensive than RPA pilots in the Air Force because a four-year degree and commissioning source is not a requirement. Proper forecasting must be implemented when updating manning requirements because certain jobs have longer lead times for training and development than others do.

From the review of literature, the researcher determined that the shortage of RPA pilots in the Air Force has fatigued the current RPA pilots because they work too many hours and are unable to balance their family life. Because the RPA pilots are working too many hours, they are unable to complete their professional military education and their advanced degrees. Lack of completed professional military education and completed advanced degrees directly correlates to low promotion rates for these officers. When officers fail to be promoted, they leave the military for more lucrative or satisfying jobs in the private sector. Currently 240 RPA pilots are leaving the Air Force each year.

The results from GAO's RPA pilot focus groups overwhelmingly suggest that the majority of RPA pilots believe there is a manning shortage of RPA pilots, and there is a problem with retaining RPA pilots. The results from the cost analysis comparison of the development of Air Force RPA pilots and Army UAS operators suggest that it would be more cost effective for enlisted airmen to operate RPAs. On the high end of the spectrum, the total cost of producing a UAS operator is $111,000 compared to the high-end cost of producing an RPA pilot that attended the Air Force Academy and traditional UPT at a cost of $786,000. In comparison, the cost of producing a UAS operator is only 14 percent of the cost of producing a RPA pilot.

In conclusion, RPA pilots perceive they are unmanned, overworked, and undertrained. This has negatively impacted their morale, family life, and retention in the Air Force. The Air Force decided that enlisted airmen should not be used as RPA pilots. They decided officers are necessary to ensure rank is commensurate with responsibility. However, the U.S. Army allows enlisted soldiers to operate their UAS and they do not have a manning shortfall and it has not affected or degraded their CAP missions.

GLOSSARY

Active Duty Soldier. Active duty soldiers consist of regular Army soldiers who are employed by the Army full time (Military Dictionary 2008).

Capability Based Assessment. Capabilities based assessment is the Joint Capabilities Integration and Development System analysis process that includes functional area analysis, functional needs analysis, and functional solutions analysis (Military Dictionary 2008).

Combat Operations. Combat operations are military actions or the carrying out of a strategic, tactical, or service military mission (Military Dictionary 2008).

Department of Defense. Department of Defense is the U.S. federal department charged with coordinating and supervising all agencies and functions of the government relating directly to national security and the United States armed forces (Military Dictionary 2008).

Government Accountability Office. The U.S. Government Accountability Office is an agency that works for Congress and the American people. Congress asks the Government Accountability Office to study the programs and expenditures of the federal government (U.S. GAO 2010).

Low Density Job. Low density jobs are jobs that require a small amount of personnel that have special skill sets (Military Dictionary 2008).

Unmanned Aircraft Systems. Unmanned Aircraft System (UAS) is an aircraft that flies without a human crew on board the aircraft (Military Dictionary 2008).

Warrant Officers. A Warrant Officer (WO) is an officer in a military organization who is designated an officer by a warrant, as distinguished from a commissioned officer who is designated an officer by a commission, or non-commissioned officer (NCO) who is designated an officer by virtue of seniority (Military Dictionary 2008).

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